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GRADUATE PROGRAM IN HEALTH CARE ADMINISTRATION

THE DEPARTMENT OF DEFENSE  
RETIREE DENTAL PROGRAM

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GRADUATE PROGRAM IN HEALTH CARE ADMINISTRATION

BY  
COLONEL STANLEY J. MCNEME, DC, USA

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## **ABSTRACT**

In September 1996, Congress passed the Department of Defense Authorization Act, 1997, Public Law 104-201, Section 703. This law mandated that the Secretary of Defense establish a dental insurance plan for military retirees, their dependents, and certain surviving spouses. This dental insurance plan shall be available to eligible beneficiaries not later than October 1, 1997. The plan shall provide benefits for basic dental care and treatment, including diagnostic services, preventive services, basic restorative services (including endodontics), surgical services, and emergency services. The plan will require voluntary enrollment and all premiums will be paid by the member.

The purpose of this study was to predict the participation rate of military retirees, their family members, and unmarried surviving spouses in this new Retiree Dental Plan. The premium for the dental program depends on the demographic mix of the eligible retirees selecting the program. An accurate forecast of the participation rate is necessary to develop the premium cost associated with the dental benefit design.

Due to its proprietary nature, experience data is not readily available from the insurance industry. Other sources were utilized to compare the retired military population against their civilian counterparts in areas of dental utilization and dental insurance coverage. The results of this study suggest the military retired population and their family members are similar to the United States population in general. Based on dental plan enrollment experience of several military retiree associations, this study anticipates an enrollment of approximately 20 percent of the eligible retirees in the Retired Dental Plan.

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## **CHAPTER I**

### **INTRODUCTION**

#### **Background Information**

The Department of Defense (DoD) is charged with providing comprehensive dental care to active duty members of the United States (U.S.) armed forces. This authority to provide active duty members dental care is found under title 10, United States Code (USC), Chapter 55, Section 1074. However; dental care for military retirees, family members of active duty and their dependents has historically been provided only on a space-available basis in military dental treatment facilities.

The Military Medical Benefits Amendments of 1966, Public Law 89-614, Section 2(4), allowed only extremely limited dental care under the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). Only care necessary as an adjunct to medical or surgical treatment of other than a dental condition has been allowed. In military dental treatment facilities, a broad range of dental services has been provided at overseas locations on a space available basis. In the U.S., only emergency dental care in addition to dental care as an adjunct to medical and surgical care was generally available. An exception to this U.S. limitation was in areas where adequate civilian dental care was not available, such as at remote duty stations. Even in these cases, dental care was available only on a space-available basis.

In 1985, the Department of Defense (DoD) Authorization Act, Public Law 98-525, Section 633, changed this situation. Dental care in all military dental facilities for all DoD beneficiaries other than active duty members was now provided on a space available basis. Unfortunately, dental work force requirements were not changed, and dental care access for family members in most locations continued to be limited.

According to Congress, the reason for extending such care to family members of active duty members was related to two factors. First, the Senate had earlier noted that, while an increasing number of civilian firms had added dental programs as part of their health care benefits, dental care insurance programs are not available to most dependents of active duty personnel. Additionally, the cost of private dental care is prohibitive for most families, particularly junior enlisted (Senate Report 98-174). Second, the Senate also noted that, because of "fiscal constraints," it was "unlikely that the Congress will authorize a dental insurance program for active duty dependents along the lines of the current CHAMPUS program (Senate Report 98-500).

The next year, despite the Senate's 1984 expression of the opinion that enactment of a program for dental care from civilian sources was unlikely, Congress authorized just such a program. The Department of Defense Authorization Act, Public Law 99-145, Section 651, provided for a voluntary enrollment basic dental benefit for dependents of active duty members. Enrollees in the Family Member Dental Program (FMDP) must share in the costs through monthly premiums paid by the active duty sponsor through payroll deductions. Rather than as an extension of CHAMPUS, the authorization was a competitively awarded, fixed-price contract with a contractor. Congress appears to have been concerned that even though it had broadened

the dental care that might be provided in military facilities, there would be only limited access to such care:

...Given the dental care requirements of the active duty force,...the amount of care available to dependents on a space-available basis will remain very limited. (House Report No. 99-81).

Congress also indicated that the program was related, in part, to the need to be competitive with the civilian employment sector:

Although dental care was not a common component of private sector health plans when the Civilian Health and Medical Program of the Uniformed Services was revised and expanded in 1966, it has become increasingly so in recent years...Routine dental care has become increasingly common in larger industries...In order to remain competitive with private industry employers who direct recruiting efforts at skilled, mid-career military personnel, the committee believes that the services need a dependent dental care benefit as a component of the compensation package. A recent survey of the military medical care system beneficiary population indicated that dental care for active duty dependents was a priority item (House Report No. 99-81).

Benefits under the FMDP extend to preventive, diagnostic, and emergency services, in which enrollees have no liability for allowed charges. For fillings, dental appliance repairs, and stainless steel crowns for children's primary teeth, the enrollee's charge is 20 percent of allowed charges. However, the new program does not cover the more costly dental procedures such as orthodontics, endodontics, periodontics, single crowns, and fixed and removable prosthodontics.

The next year, the National Defense Authorization Act for Fiscal Year 1987, Public Law 99-661, Section 707(a), amended the dependents' dental program. The amendment provided that the maximum monthly premium that could be charged for enrollment of a member and the member's dependents in the program was \$10.

In 1992, the Department of Defense Authorization Act, Public Law 102-484, Section 701, added improvements to the dependents' dental program under section 1076a of title 10, United States Code. Orthodontic services, crowns, gold fillings, bridges, complete or partial dentures, and such other services as the Secretary of Defense considers to be appropriate were authorized by Congress to be added. The family members were to pay a percentage of the charges for this new care as determined by the Secretary of Defense.

During this same time period, a Program Decision Memorandum dated 22 September 1992 directed the reduction in "medical expenditures through economies and efficiencies such as....reducing dependent dental care to 10 percent of total workload." This 10 percent space available care enables the services to fulfill training program requirements and allow for dentists in the rotation base to maintain their skills. The 10 percent limit did not apply to dental emergency care or to care provided to sponsored, eligible family members located outside the continental United States (OCONUS) in areas where the dependents' dental plan was not available.

The Department of Defense Authorization Act, 1994, Public Law 103-337, Section 703, authorized the Secretary of Defense "to establish basic dental benefits plans for the provision of dental benefits outside the U.S. for the eligible dependents of members of the uniformed services accompanying the members on permanent assignments to duty outside the U.S.."

The Department of Defense Authorization Act, 1996, Public Law 104-106, Section 705, established program authority for the Secretary of Defense to establish a dental insurance plan for members of the Selected Reserve of the Ready Reserve. This plan shall provide for voluntary enrollment and for premium sharing between DoD and the members enrolled in the plan. The member's share was not to exceed \$25 per month. The dental insurance shall provide benefits for basic dental care and treatment, including diagnostic services, preventative services, basic restorative services, and emergency oral examinations. The Selected Reserve Dental Insurance Program has an expected start date of 1 October 1997.

#### **Conditions Which Prompted the Study**

One of the effects of the downsizing of the military is the increasing difficulty of the services to honor previously implied benefits of dental health care to family members of active duty soldiers as well as retired members of the Uniformed Services. Retirees and their family members can be treated in a military dental treatment facility only on a space available basis. Due to policies and current workload requirements, access is essentially non-existent. A retiree dental insurance program which would mirror the dependent dental program had wide support from both within the Office of the Secretary of Defense (OSD), the Military Coalition, and other groups.

A 1993 dental insurance survey (BUMED 1993) completed by 4995 retired Navy and Marine Corps retirees indicated their support and willingness to pay for a dental insurance program.

In a recent study on the Selected Reserve Dental Program (Birch and Davis 1996), 39.5 percent of enlisted and 25.1 percent of officer members were not covered by dental insurance. Of this number without dental insurance, 78.9% of the officers and 84.6 percent of the enlisted

expressed an interest in a dental insurance program. This study concluded that based on experience from the Family Member Dental Program, an 80 percent enrollment rate could be expected. Working with the numbers, approximately 25 percent of the ready reserve are projected to participate in the program.

In September 1996, Congress passed The Department of Defense Authorization Act, 1997, Public Law 104-201, Section 703 which authorizes the Secretary of Defense to establish a dental insurance plan for military retirees, certain unremarried surviving spouses, and dependents. This dental insurance plan shall be available to eligible beneficiaries not later than October 1, 1997. This plan will require voluntary enrollment and all premiums will be paid by the member. Coverage will be continuous unless a member dies, returns to active duty, or stops paying into the plan.

Persons eligible to enroll in the dental insurance plan:

1. Members of the armed forces who are entitled to retired pay.
2. Members of the Retired Reserve who would be entitled to retired pay under chapter 1223 once reaching 60 years of age.
3. Eligible dependents of a member described in paragraph 1 or 2 above who are covered by the enrollment of the member in the plan.
4. The unremarried surviving spouse and eligible child dependents of a deceased member who dies while in a status covered by paragraphs 1 or 2 above.

A member enrolled in the retiree dental insurance plan shall pay the premiums charged for the insurance coverage. The amount of the premiums payable by a member shall be deducted and withheld from the retired pay and shall be disbursed to pay the premiums.

The dental insurance plan should provide benefits for basic dental care and treatment, including diagnostic services, preventive services, basic restorative services (including

endodontics), surgical services, and emergency services. This plan shall provide for voluntary enrollment of participants and shall authorize a member or eligible unmarried surviving spouse to enroll for self only or for self and eligible dependents.

### **Statement of the Research Question**

What will be the demand for a retiree dental program by military retirees, their dependents, and unmarried surviving spouses?

### **Literature Review**

#### **Employee Benefits Programs**

In general, employee benefit programs are viewed as a commitment to providing economic security to active workers, displaced or disabled workers, and retirees and their families (Finkel 1991). The rationale for retiree health and dental insurance should be considered within an overall framework of the firm's personnel objectives. For most individuals, the total compensation for continuing to work includes both cash compensation and employer-provided in-kind benefits. Firms offer various types of employee benefits to increase total after-tax compensation to workers (Clark 1994).

Most employees can be expected to believe that a comprehensive package of benefits covering their security needs is a right of employment. This can be viewed as part of their compensation reward for choosing to work for one employer rather than some other employer. Employees believe this because that is how benefits are promoted by employers. The employer purports the company's employee benefits plan as part of total compensation that is competitive

with, or usually better than, the benefits plans of other employers with whom they compete for labor (Griffes 1983).

From the manager's perspective, it is important to be competitive in the labor market. The goal is to attract productive employees and then hold on to them. Workers covered by defined benefit pension plans have lower quit rates than other workers (Quinn 1990). The cost of hiring and training workers is high, and the loss of an experienced and productive employee is serious. The effect on production and profits of losing a good employee is a double effect. First, the additional cost of replacement, and second, the production lost during the period of training for the new employee (Fottler 1994).

Benefits have long been perceived by management as playing an important role in reducing employee turnover, but there is little evidence to what benefits are the major influence in reducing turnover (Ivancevich 1993). Lower quit rates can reduce turnover and training costs, while increasing retirements may lower current labor costs by replacing older workers with lower-paid, younger workers (Clark 1994). The direct costs of these benefits must be balanced against cost savings in other areas associated with changes in worker behavior and the enhanced ability of firms to achieve their personnel goals. Benefits are only one of many features in the work environment. An employee may leave for many reasons, one of which may be related to benefits. To the extent that an employer's benefit programs as a whole are not competitive, or specific plans are seriously deficient, an employee may be influenced to leave by the availability of generous benefits with another employer (Griffes 1983). This is no different than if salary levels are not competitive in the market.

In April 1993, the U.S. Census Bureau fielded a supplement to the Current Population Survey (CPS) that included questions to collect data on the pension and health plan coverage of over 27,000 workers. In April 1993, there were 112.5 million civilian American workers between the ages of 18 and 64 with jobs. Eighty-two million (73 percent) of them worked for an employer that sponsored a health insurance plan, and 65 million (58 percent of all workers) participated in their employer's health plan. Among the reasons that those who chose not to participate in their employer's health plan, 75 percent stated that they were covered by another health plan (EBRI 1994). Large firms, 5000-9000 employees, and very large firms, greater than 10,000 employees, are more likely to offer retiree health benefits than smaller firms (Dopkeen 1987).

Dallas Salisbury, president of the Employee Benefit Research Institute, found that 66 percent of employees in medium to large sized firms had dental benefits (Salisbury 1993). He also found that 37 percent of group health plans had deductibles greater than \$150. Coinsurance also grew from 55 percent of plans in 1989 to 97 percent of plans in 1990. Of the 48 percent of employers with a dental benefit, 58 offer a free-standing plan, one that is not attached to their medical carrier (Barnett 1996). In a 1988 Bureau of Labor Statistics Survey, 45 percent of the health plan participants in the survey worked for employers who financed all or part of health and dental care protection after retirement (Warshawsky 1992).

### **Dental Insurance**

The dental insurance concept was first proposed as early as 1945 by the American Dental Association (ADA). Pilot programs continued throughout the 1950's, with the first comprehensive group dental plan being offered by the Continental Casualty Company in August 1959 (Reich 1996). Dental benefit plans have grown quickly and are now the third most-frequent

health (trailing health and disability) benefit provided by employers (Findlay 1994). The 1994 Edition of the U.S. Chamber of Commerce Employee Benefits Survey indicated that 51 percent of employers provide a dental benefits program.

About 100,173,000 people in the U.S., 40.5 percent of the population aged 2 and older, are covered to some degree by private dental insurance (ADA 1994). In 1991, the U.S. spent \$37.1 billion for dental services, representing 5 percent of all health care expenditures and an annual growth rate of 8.5 percent since 1987. Of the \$37.1 billion, only 43 percent was covered by private insurance, with an additional 1.6 percent covered by federally supported and 1.3 percent by state supported programs (Letsch et al. 1991).

Initially, most employers in the U.S. offered dental benefits under a comprehensive medical plan. Under such integrated plans, dental expenses are combined with major medical benefits in the calculation of plan benefits. Subsequently, product designs shifted to freestanding fee-for-service dental plans, with 66 percent of all plans offered this way today (Employee Benefit Plan Review 1994). Dentistry is still fairly inexpensive. Of the \$800 billion spent for medical care in the U.S., \$38 billion is for dental care, which is approximately 4.8 percent of total medical care expenditures (Libin 1996). The average dental plan cost per employee was \$373 (Harris 1993).

Dental insurance is different from medical insurance, primarily because the most important purpose of dental insurance is to improve dental health, whereas the primary purpose of most other health insurance is to minimize the impact of severe, unexpected expenditures (Berry 1986). Dental insurance also differs from health insurance because dental care is high frequency, low cost and is not really insurable since it lacks the characteristics of an insurable risk (Guay 1991). Health insurance is insurance in the classic sense. It insures low frequency, high cost care (Mayes

1996). A dental insurance program is not insurance against a catastrophic, rarely occurring event, but in reality is prepayment for a potentially universal need (Zatz, Landay, and LeDell 1987).

Dentistry is still a cottage profession where 80 percent of the providers are generalists (Guay 1995), and 84 percent of the private dental practices are solo (Mayes 1995). In contrast, only 20 percent of physicians have no specialty training and a slightly larger 34 percent are in solo practice (Neels 1994). A patient's medical care is usually provided by a number of physicians, often in several different institutional settings. Dental care is largely provided by one dentist at a single site.

Dentistry deals principally with two diseases-caries and periodontal disease. Prevention in dentistry is cost effective. Compared to medicine, dentistry's diagnostic costs are a relatively small portion of total costs. Alternate dental treatments are almost always available. Americans pay physicians 14 percent out of pocket, but dentists 50 percent. Finally, only 5 percent of dental care is paid for with public funds, while physicians collect 36 percent of their fees from public funds (Mayes 1996).

Dental care is more predictable and manageable compared with medical care (Nasser 1996). Dental treatment is perceived as postponable, elective and, except in rare instances, is not life threatening (Mayes 1993). Diagnosis and treatment are more standardized and vary less than in medicine, which involves a complex array of disease (Mayes 1993). Dentistry has employed prevention for years. This fact, coupled with fluoridation of community water, has significantly reduced the incidence of dental disease. In addition, these low-cost preventive measures have reduced dental expenditures and demand for treatment (Glasgow, Beazoglou, Mark 1991).

As dental care becomes more interventional, it encompasses an increasing market for state-of-the-art high cost treatments such as dental implants and CAD-CAM procedures. Both of these items are costly enough and sufficiently random in their incidence that patients will be interested in insuring against them (Stillman and Douglass 1993).

With general improvements in dental care and health status, more older adults are retaining their teeth (Douglass et al. 1993), and will still need dental care (Reinhardt and Douglass 1989). This trend is creating an age-dependent demand for dental care that mirrors the age-dependent demand for medical care (Neels 1994). Meanwhile, a growing amount of costly high-technology equipment increases the value of successful prevention at the same time that it provides more preventive care and diagnostic services. All of these considerations suggest that third-party dental insurance is likely to become more central to the practice of dentistry in the future (Neels 1994).

### **The Actuarial Function**

#### **a. History**

The foundation of actuarial science was laid in 1671 when Johannes de Witt, then prime minister of the Netherlands, showed how to develop the annuity value in connection with the sale of annuities as part of a financial plan to redeem the public debt. The next step forward was taken a hundred years later and resulted in the establishment of life insurance companies. The development of the theory of premiums and reserves for these companies occupied the greater part of the nineteenth century. Funds to provide pensions to retired employees and to widows of deceased employees were established also and actuaries were consulted as to the appropriate financial arrangements.

During the latter part of the nineteenth century and the early part of the twentieth century, a series of papers by the British consulting actuaries of the day reported on pension fund experiences. These papers set forth the actuarial techniques employed, and these techniques are in general use today (Marples 1985). Some years after world War I, the insurance companies entered the field and added their theory and practices to the techniques of the consultants. The major contribution of insurance companies lay in the adaptation of group insurance procedures to pensions, an innovation that developed in the U.S. and spread rapidly to Great Britain and elsewhere.

#### b. The Actuary

If human work life and longevity could be predicted with certainty, there would be no actuaries as such no development of actuarial theory and technique (Elandt-Johnson and Johnson 1980). The actuary is concerned with procedures to deal with the uncertainties of the events in this connection and to develop financing systems with predictable limits.

Specifically, the actuary's basic function in a plan is to combine the probabilities of continued participation in the plan by an individual with the estimate of the benefit to be provided. After allowing for the investment income on invested contributions, the actuary derives a system of payments into the fund which will support the benefits. Basically, the actuarial function is to illustrate the effect of actual or potential policy decisions by mathematical calculations and cost (Marples 1985).

The actuary starts with the desires of the employer and a general or specific knowledge of the needs of the employees. Through recommendations and cost demonstrations throughout the various stages of the development of the plan's structure, the actuary tries to chart a financial

course avoiding excessive risk taking which could cause large losses or excessive conservatism and could produce large gains (Pokorski 1994). In the cost estimate, the actuary attempts to balance the potentialities of gain and loss in arriving at an adequate basis of operation.

One of the most important functions of the actuary is to provide the initial estimate of cost and the subsequent reviews of the estimate based on accumulated experience. It has been recognized the initial estimates are probably of greater importance since the employer will adopt a schedule of benefits based on this advice (Marples 1985). Once the schedule is established, the cost to the employer will develop from events outside the actuary's control. His concern at any stage will be to develop the most probable measure of the liabilities and to advise the employer on appropriate contributions.

All insurance plans demand some form of actuarial cost estimate in the initial determination of benefits and cost and in the subsequent reappraisals or reviews. These cost estimates are produced by technical calculations which convert the basic cost determinants into the actuarial multipliers. These multipliers may be premium rates. The gross cost items are then obtained by applying the multipliers to the relevant statistics of participants. Consequently, there is a direct relationship between the bases of the calculations and the derived amounts (van de Ven and van Vliet 1995).

#### c. Actuarial Valuation

The actuary must do a valuation of the proposed plan and will present this in a written report to the employer. The following items will be included in the valuation report (Barton 1983):

1. A description of the employee population summarized by age, sex, length of service, and salary levels. This report should also comment on any inadequacies in the data provided to the actuary and explain any assumptions made about the characteristics of the population, if the data was inadequate.
2. A summary of the assets of the plan, showing both book and market value as well as an explanation of the values used for valuation purposes.
3. An outline of the benefit provisions.
4. The results of the valuation, including the employer contribution requirements.
5. A summary of the actuarial funding method and a description of the actuarial assumptions used as well as the justification for any changes in assumptions.
6. Any items the actuary believes require the attention of the plan sponsor, including a discussion of any emerging trends that could affect future cost calculations.

In determining the appropriate probabilities of usage at various ages, the actuary must consider the characteristics of the employee population. The characteristics of this plan population that have a bearing on the actuarial costs are the number, sex, age, length of service and salary, if salary is a determining factor in the benefit formula (Barton 1993).

#### d. Actuarial Cost Methods

Actuarial cost methods are merely methods for assigning the cost of the benefit payments. Ultimately, the cost of a plan equals the sum of all the benefits and expenses paid from the plan, less any employee contributions and the plan's investment return. Actuarial cost methods do not affect these ultimate costs, except indirectly they may influence the amount of investment income by influencing the size of the fund or the timing of contributions (Rosenbloom 1988).

Rosenbloom presents a variety of ways in which actuarial cost methods may be classified in The Handbook of Employee Benefits: Design, Funding and Administration. Methods may be divided between: (1) those methods which allocate the benefits of the plan to particular plan years and then determine the actuarial present value associated with the benefits assigned; and (2) methods which allocate the actuarial present value of all future benefits to particular plan years without allocating the benefits themselves.

A second way of classifying actuarial cost methods is between accrued benefit methods and projected benefit methods. An accrued benefit method is based upon the amount of benefits earned to date, while a projected benefit method is instead based upon the projected amounts of benefits expected to be paid from the plan.

A third way of classification divides actuarial cost methods between those which directly determine the actuarial gain or loss and those which do not determine a gain or loss.

A fourth way of classifying divides actuarial cost methods between individual methods and aggregate methods. Under an individual method, the normal cost of the accrued liability may be calculated for each individual participant. Under an aggregate method, the costs are determined for the group as a whole in such a way they cannot be determined separately for individuals.

A fifth way of classifying is between methods which result in an initial accrued liability when the plan is established or amended and those which do not. If a method does not produce an initial accrued liability, the cost of all benefits must be funded through normal costs.

A sixth classification method is between open group methods and closed group methods. A closed group method considers only the group of present plan participants, while an open group method considers employees expected to be hired in the future as well.

Hayes did a study to examine the feasibility of using routinely available data to access the average risk of employees enrolled in competing health plans. The objectives of the study were to evaluate several alternative risk-assessment models and predictors of health care costs. Three risk-assessment models were developed: an actuarial model, an individual-subscriber-level regression model and an employer-group-level regression model. He found the actuarial model, based on demographic variables, performed better than either of the more complex regression models (Hayes 1991).

### **Dental Utilization**

The 1989 National Health Interview Survey (NHIS), a continuing nationwide household interview survey conducted each year, has two parts: (1) a basic health and demographic questionnaire, which is the same every year; and (2) several health specific topic questionnaires, which change yearly. The 1989 NHIS included an oral health care supplement with information on frequency of dental visits, interval since last dental visit, reason for no visit during the past 12 months, edentulism, perceived health status and limitation of activities.

Since 1964, there has been a steady increase in the percent of the U.S. population aged two and older who visited the dentist in a 12 month period. During the 1980's, that figure increased from 50 to 58 percent. The percent of older adults with dental visits has increased since 1964. For those adults aged 65-74, the percent visiting a dentist went from 25 to 48 percent. In those 75 and older, the percent more than doubled from 15-36 percent (National Center for Health Statistics 1990).

Forty-three percent of adults aged 65 and older, interviewed in 1989, had visited a dentist in the past 12 months. This compared to 54 percent of those aged 55-64 and 61 percent of those

aged 35-54. Looking more closely at older age groups, 48 percent of those aged 65-74 and 36 percent of those 75 and older had visited a dental office within the last 12 months (Gift 1993).

There were no differences in visit pattern by gender. Older adults (ages 65+) who were white, 45 percent, or who had more than 12 years of education, 67 percent, were more likely to have made a dental visit in the past 12 months than were blacks, 22 percent, or those with fewer years of education: less than 9 years, 24 percent; 9-11 years, 34 percent; 12+ years, 49 percent (Gift 1993).

Dental visits are directly related to income and insurance. Twenty-six percent of older adults with incomes less than \$10,000 had a visit in the past twelve months, while 68 percent of those with incomes of \$35,000 or more made a visit. Similarly, 61 percent of those with insurance reported a visit, while only 42 percent of those with no reported insurance made a dental visit (Gift 1993). Therefore, having dental insurance increases demand. The findings of the National Survey of Oral Health in U.S. Employed Adults and Seniors noted that 52 percent of all employed adults aged sixty or older had dental care coverage while only 34 percent of non-employed seniors had similar coverage (Department of Health and Human Services 1987).

The average number of dental visits in the U.S. population in 1989 was 2.1 visits per person per year. Adults aged 35-54 had 2.3 visits, those between 55-64 averaged 2.4 visits, and those aged 65 or older averaged 2.1 dental visits. The associations of race, ethnicity, education, insurance and income with dental visits in a 12 month period were similar to those reported earlier for interval since last visit (Gift 1993).

The average number of dental visits is affected by the presence of teeth. Among those aged 65-74, those with teeth had 2.7 visits compared with 1.0 visits for the edentulous. Among those 75 and older, the dentate averaged 3.0 visits and the edentulous 0.5 visits (Gift 1993).

The association between average number of dental visits and perceived health status and limitation of activities is apparent. Those individuals 65 and older with fair/poor assessed health had fewer dental visits per year than those with good to excellent assessed health (1.5 vs. 2.3). Older adults (65+) who were unable to perform major activities had fewer dental visits per year than those with no limitations (1.7 vs. 2.2) (Gift 1993).

Manski analyzed secondary data from the NHIS survey and found that 30 percent of older adults had dental insurance (Manski 1995). He found that employed older adults were more likely ( $p<0.005$ ) to have dental care coverage than a similar group of non-working older adults. Older women were less likely ( $p<0.02$ ) to be covered by dental insurance than older men. Older adults with higher levels of family income were more likely ( $p<0.0001$ ) to be covered by dental insurance than comparable older adults with lower income levels. He also found that single and widowed, divorced or separated ( $p<0.0004$ ) older adults were less likely to be covered by dental insurance than married older adults.

The study of dental and medical care use among older adults reveals some interesting contrasts. Determinants common to dental and medical care often have opposite effects (Wolinski and Arnold 1989). For example, older adults have the highest rate of use of physician and many other medical services, but they have the lowest rate of dental care use (Evashwich et al. 1985). Lower income persons use more medical services, but use dental care less often than

their higher income counterparts, and persons with low educational attainment use more medical services but less dental care services (Hulka and Wheat 1985).

Dental care is commonly viewed as a discretionary health service, and this is reflected by the contributions made by predisposing and enabling characteristics. Poor oral health adds to the other disadvantages already borne by older adults of lower socioeconomic status (Jones et al. 1990). Dental care ranks low among competing health care priorities (Marinelli et al. 1982). Fear or anxiety seems to dissuade only a small percentage of older adults from seeking dental care (Kiyak 1987).

Research findings to date suggest that the ability to afford dental care affects its use. Removal of the cost barrier does not necessarily equalize dental care utilization by lower socioeconomic status groups with that of higher socioeconomic status groups (Gilbert 1995). In one study, Medicaid recipients with no out-of-pocket costs for dental care actually used care less often than those who faced financial barriers (Branch et al. 1986). Another study showed that the use of dental care by older adults did not increase when cost barriers were removed (Barenthin 1976). Additionally, in some studies, only small percentages of older adults reported cost as a reason for not seeking regular care (Kiyak 1987); (Dolan et al. 1988). Typically, reduced-fee or free programs have increased demand for services significantly for a brief period after enrollment but have not led to regular dental care use. Rather, many enrollees have sought care for treatment of symptoms and reconstructive services instead of preventive or diagnostic services (Gilbert 1995).

Prior to the 1980s, little was known about the effect of dental insurance on utilization. This lack of information on the effect of dental insurance, as well as shortcomings of previous

non-experimental studies, led to the Rand Health Insurance Study (HIS). The Rand HIS is a randomized trial designed to study the effects of different health insurance policies on the demand for health services and the health status of individuals (Bendall and Asubonteng 1995). The study is also designed to overcome the many shortcomings of earlier studies in order to provide estimates of the effect of cost sharing for a general or representative population (Manning et al. 1995).

One of the major findings in the Rand HIS is that dental services are significantly more responsive to cost sharing than other out-patient health services. An increase in cost sharing led to a larger percentage decrease in use of dental services during the first year of dental coverage, but the decrease was less responsive in the second year (Bailit 1984).

The Manning study provided details of the experiment and results of the Rand HIS. This study reveals that insurance plans with lower coinsurance rates have higher use of dental services. Utilization of dental services among participants increases significantly as the coinsurance rate decreases from 95 percent (patient pays 95 percent of dental charges) to 0 percent (patient pays no dental charges). Additional findings suggest that higher income leads to higher use of dental services (Manning et al. 1985).

Applying a methodology similar to that of the Rand study, Mueller and Monheit analyzed non-experimental survey data from the 1977 National Medical Care Expenditure Survey. The survey covers health insurance coverage and medical care utilization and expenditures. Using a two part model, demand is measured by access to care (at least one visit during the year) and by amount of services conditional on some dental care use (Mueller and Monheit 1988).

They found all insurance variables have positive effects on the likelihood of use and conditional expenditures. The average probability of use under the assumption of no insurance is 0.47. Insurance increases the likelihood of use to the level of 54 percent under the deductible plan; 55 percent under the coinsurance rates of 10 percent or less; and 57 percent under the coinsurance rates of more than 10 percent. Plans with coinsurance rates less than 10 percent exceeded expenditures under deductible plans by approximately 20 percent.

With insurance status held constant, the money price variable indicates that once the decision to seek dental care is made, money price becomes less of a factor in obtaining the marginal visit required to complete the dental treatment. Results also suggest that users receive basic dental services regardless of their insurance status. However, insurance has a direct effect on the use of more expensive dental care (Mueller and Monheit 1988).

Price is cited frequently as a barrier to receiving dental care. Half of the American population thinks dental prices are too high (Capon 1982). A study by Grembowski and Conrad examines the relationship between coinsurance, a provision in a member's coverage that limits the amount of coverage by the plan to a certain percentage, commonly 80 percent, and dental prices for 16 dental services among a sample of Pennsylvania Blue Shield adult insured (Grembowski and Conrad 1986). This study reveals that coinsurance effects are not predicated on whether the service has high or low out-of-pocket costs. Instead, insurance greatly reduces the patient's sensitivity to money price variations. Time cost variables have significant effects on some, but not all, dental service prices. The results of this study indicate that dental insurance reduces the patients sensitivity to money price, in which instance the non-price factors become more

important in the patient search for dental treatment. Coinsurance effects are found to be relatively small, suggesting reduced sensitivity to money price in an insured population.

### **Purpose**

To restate the problem statement: how can we estimate the number of retirees and their family members who would be interested in participating in a retiree dental insurance plan as well as the expected usage levels? Knowing the anticipated participation rate is essential to arriving at a fair cost for the dental insurance program, both for DoD and individual participants.

The focus of this study is to arrive at a method that will enable the Department of Defense (Health Affairs) to predict the actual participation rate. This is an exercise that medical and dental insurance company's do as a matter of routine. Unfortunately, this information is proprietary and not easy to obtain. Little information is found in the medical or business literature on this type of estimation. This is information that civilian consulting firms specialize. The method used in this study may help the DoD save money in future insurance endeavors.

## **CHAPTER II**

### **METHOD AND PROCEDURES**

The method to estimate the anticipated participation rate in the retiree dental program began with a thorough literature search. Dr. Edward Martin suggested I use an actuarial technique to arrive at an estimation of participation rates. An actuarial model is essentially a standard rate table approach to determining risk. Cost weights are developed by classifying participants by demographic risk class and calculating a mean or expected cost. Actuaries need to know the number of individuals and their demographics to calculate the cost of an insurance plan.

Birch & Davis Associates, Inc. did the study on the Selected Reserve Dental Program (SRDP). They arrived at a fairly simple method to project enrollment in the program. Based on the "1992 DoD Reserve components Survey" (supplemental tabulations for survey questions 50-54), 39.5 percent of enlisted and 25.1 percent of officer members were not covered by dental insurance.

This survey also asked the level of interest Selected Reservists had in participating in a DoD sponsored program. For the purpose of the analysis, all members who replied "yes" or "not sure" were considered part of the SRDP target market. Since the projects goal was to estimate total program costs, Birch & Davis decided to use the highest number of potential enrollees in their analysis. Their rationale was that it supported planning for sufficient funds during the budgeting and programming processes. On this basis, the SRDP target market was determined to be 87.9 percent of the officer members and 84.6 percent of the enlisted personnel.

To estimate the incidence of enrollment, (Table 1), the total numbers of officer and enlisted personnel were adjusted based on: (1) the percentage that are not currently covered by an insurance plan (25.1 percent and 39.5 percent, respectively); (2) the percentage who may have an interest in an insurance plan (78.9 percent and 84.6 percent respectively); and (3) an assumed participation rate of 80 percent (based on the current participation rate in the Family Member Dental Insurance Program).

**Table 1**

Selected Reserve Dental Insurance Program Calculations		
Category	Officer	Enlisted
Number of personnel	150,000	739,000
Number not currently covered	37,650	291,905
Number interested in coverage	29,706	246,952
Anticipated enrollment (80 % participation)	23,765	197,562

The calculations are straightforward:

- |  |                     |
|--|---------------------|
| 1. 150,000 officers                                | 1. 739,000 enlisted |
| 2. 25.1 % not covered by dental insurance = 37,650 | 2. 39.5 % = 291,905 |
| 3. 78.9 % interested in the plan = 29,706          | 3. 86.4 % = 246,952 |
| 4. 80 % of interested in plan enrolling = 23,765   | 4. 80 % = 197,562   |
| 5. 23,765 interested of 150,000 officers = 15.84 % | 5. 26.73 %          |
| 6. Total Selected Reserve strength = 889,000       |                     |
| 7. 221,327 anticipated enrollment at 80 %          |                     |
| 8. 25 % projected enrollment in the SRDP           |                     |

Since the SRDP is not operational yet, the accuracy of this estimate of anticipated participation in the plan can not be assessed. In addition to the above Birch & Davis methodology, I will need to use information from several sources to arrive at a formula that will enable me to calculate and predict the anticipated enrollment in the Retiree Dental Program.

I will use several tools that I have at my disposal to develop a methodology to estimate participation in the Retiree Dental Program. I have no survey available that asks the questions of retirees that was asked in the "1992 DoD Selected Reserve Survey." The "Comprehensive Study of the Military Health Services System" (733 Study) included 10 questions on the most recent

dental visit by a family member (sponsor or dependent). Only three questions were concerned with utilization. One question asked which eligible family member had the most recent visit to a dentist. A second question asked if this most recent dental visit was either within the past 6 months or more than 6 months ago. The third question asked what the reasons for this family member's most recent dental visit were. The other questions were either demographic or satisfaction related. The data from these three questions may be helpful.

The 1994-95 Health Care Survey of DoD Beneficiaries also asks several dental utilization questions. This 1994-95 survey has the most current results. This survey asked two questions on utilization. The first question asked if the person answering the survey questions had a dental exam within the past 12 months. The second question asked how many times this individual went to a dental office or clinic during the past twelve months. Fifteen questions were concerned with demographics such as age, sex, active duty and branch of service, family member of active duty and branch of service, retired from active duty and branch of service, family member of retiree and branch of service, current or pay grade at retirement, sponsor's pay grade and branch of service, education level, race, length of stay at current address, and zip code information.

The Resource Analysis Planning System (RAPS) is a world wide DoD relational database of all eligible DoD beneficiaries. Since RAPS is a database, it can generate a variety of reports customized to the needs of the end user. Of interest to this study is the information on CHAMPUS eligible retirees (younger than age 65), CHAMPUS eligible dependents of retirees, and Medicare eligible beneficiaries. This population can be broken down by sex and also by several age categories: retired 25-34, 35-44, 45-64, and 64 and over. I can also get the same break-down for retired family members as well as survivors.

Millman & Robertson, Inc., Actuaries and Consultants, did a study for the retiree dental plan in November, 1994. They calculated a cost for the retiree dental plan based on a 100 percent initial enrollment. They did an actuarial analysis and developed a voluntary coverage factor of 1.325. They also developed claims cost age/sex factors for the four categories of dental coverage. They calculated adjustment factors comparing the retiree and dependent population against the then Delta Dental Plan population and came up with relativity factors. Finally, Millman & Robertson calculated a cost projection based on three retiree participation scenarios, 10 percent, 20 percent, and 30 percent. These numbers should prove helpful, but more important, perhaps I can get some advice from this firm.

In March 1993, the Navy Advisory Committee on Retired Personnel made a recommendation to the Secretary of the Navy (SECNAV) that a retiree dental plan be established. The SECNAV response was to develop a survey, publish it in Shift Colors and Semper Fidelis to gauge retiree interest in dental insurance. There were 4995 surveys answered and analyzed. The total potential Navy and Marine retiree population for this survey was 475,749. The survey asked 12 questions. Although this was not a scientific survey, it did ask questions about utilization and dental insurance coverage. I should be able to utilize this data.

There is a fair amount of literature on dental utilization. I have literature that compares active duty Army personnel with their civilian cohorts. The Rand Corporation published a study in 1987 titled "Explaining Dental Utilization Behavior." This literature combined with the above resources should enable me to establish a methodology that will predict the anticipated participation in a retiree dental program.

## **CHAPTER III**

### **RESULTS**

According to the Health Insurance Association of America (HIAA), during 1990 approximately 100 million people were covered by dental insurance (HIAA 1990). Sixty-six percent of workers in large and medium sized firms had dental benefits in 1990 (Salisbury 1993). Dental care is not universally distributed. While many younger Americans are offered assistance in paying for dental care through dental insurance, few older Americans are offered this opportunity because dental care coverage is usually job based (Manski 1995).

A 1976 study targeting retired members of the armed forces and their family members showed that approximately two-thirds of this group reported at least one dental visit in 1976 (Schaumaker 1976). More than four-fifths of this group saw a civilian dentist during this time frame. Those retired beneficiaries who saw a civilian dentist in 1996 can be broken down by age group. Retirees and their beneficiaries aged 45+ years saw a civilian dentist 78.5 percent of the time within a given year.

In a recent study, 41 percent of employed seniors had dental coverage compared with only 22 percent of a similar group of unemployed retired seniors (Manski 1994). This is confirmed by DePorter who found that 60 percent of all Americans do not have dental plan coverage (DePoeter 1994).

Using data on 975 elderly persons from the 1990 Health Supplements to the Panel Study on Income Dynamics, Kington, et al. found the majority of elderly persons remain without private supplemental insurance for dental services. In 1990, 44 percent of persons 66 years old and

above used dental services, and 88 percent of the average total expenditure or \$378 was paid out of pocket (Kington 1995). He found only 13 percent of this group had dental insurance.

Chisick found that annual dental utilization by soldiers exceeded that of U.S. employed adults (Chisick 1990). Annual dental utilization by officers (74.6 percent) and enlisted personnel (68.6 percent) exceeded employed U. S. adults (58.5 percent).

In a 1988 dental utilization survey, Chisick and Guerin found that 63.2 percent of all Army spouses ages 18-54 had visited a dentist within the past year (Chisick and Guerin 1990). They found that age clearly has an effect on dental utilization. The proportion of dependent spouses who had seen a dentist within the past year increased with age from 18-34 year olds (60.4 percent), to 35-44 year olds (70.0 percent), to 45-54 year olds (74.4 percent).

The 1989 National Health Interview Survey (NHIS) produced different results. Where the Chisick and Guerin study showed that utilization increased with age, this survey found that dental utilization displays an inverse U-shaped relationship with age for both males and females. For all females ages 18-54, 63.0 percent had seen a dentist within the past year. For the 18-34 year old group utilization was 62.0 percent. This number increased to 66.1 percent for the 35-44 year group, but decreased to 61.1 percent for the 45-54 year old group. Only 54.8 percent of the 56-64 year old group had seen a dentist within the past year, and 43.4 percent of the 65+ age group had seen a dentist.

For males in the 18-34 age group, 51.5 percent had seen a dentist within the past year. This number increased to 59.6 percent of the males ages 35-44 and decreased to 57.2 percent for the 45-54 age group.

The 1986 National Survey of Oral Health of United States Adults sponsored by the National Institutes of Health (NIH) found the dental utilization numbers among spouses to be higher since this study looked at employed persons only. For all ages from 18-64+, 62.9 percent had seen a dentist within the past year. For ages 40-44 the percentage was 60.9. This number increased to 70.3 percent for ages 45-49 and decreased back to 61.8 percent for ages 50-54. However, for ages 55-59 the number of spouses visiting a dentist within the last year increased to 68.0 percent and to 72.72 percent for spouses aged 60-64+ (Table 2). The percentages for males were similar to the females group but somewhat lower.

**Table 2**

Dental Visits in Past Twelve Months						
	Women			Men		
	DoD	NHIS	NIH	DoD	NHIS	NIH
Age Group	%	%	%	%	%	%
18-34		62.0			51.5	
35-44	66.5	66.1		62.5	59.6	
40-44			60.9			60.9
45-54	71.5	61.1		61.9	57.2	
45-49			70.3			54.5
50-54			61.8			59.5
55-59			68.0			59.3
60-64			72.7			58.2
55-64	72.8	54.8		68.9	53.6	
65-74	78.6			73.4		
65-69			44.6			38.5
70-74			38.1			33.9
75+	78.1	36.9		78.0	34.6	

In a 1992 study, Chisick compared dental utilization of U.S. Army soldiers against their employed civilian counterparts. He used the 1986 Oral Health of United States Adults survey for his civilian figures. He found that dental utilization by active duty soldiers greatly exceeds that of their civilian cohorts (Chisick 1995). Overall, over 80 percent of all soldiers had seen a dentist within the past year and greatly exceeds that of their civilian employed cohorts. The table below summarizes his findings for the age groups that can retire from the military (Table 3).

**Table 3**

<b>Proportion of the Population Seeing a Dentist Within the Past Year</b>								
<b>Men</b>					<b>Women</b>			
<b>White</b>		<b>Black</b>		<b>White</b>		<b>Black</b>		
<b>Age</b>	<b>Military</b>	<b>Civilian</b>	<b>Military</b>	<b>Civilian</b>	<b>Military</b>	<b>Civilian</b>	<b>Military</b>	<b>Civilian</b>
<b>40-44</b>	87.7 %	62.6 %	87.1 %	43.9 %	80.4 %	63.0 %	89.5 %	53.8 %
<b>45-49</b>	89.8	56.8	87.1	46.6	90.5	75.5	100	36.2
<b>50-54</b>	88.8	61.9	90.9	34.5	100	65.3	----	42.8
<b>55-59</b>	94.7	60.7	---	40.5	---	71.6	---	43.8
<b>60 +</b>	100	62.2	---	24.5	---	76.8	---	39.3

#### **National Health Interview Survey: 1989**

The 1989 National Health Interview Survey (NHIS) is a cross-sectional survey conducted by the National Center for Health Statistics (NCHS), collecting data on the oral health of the civilian noninstitutionalized population of the United States. This report contains national estimates of the number and timing of dental visits, the oral health practices of and the use of fluoride products and dental sealants by children, the edentulous population, private dental insurance coverage, and the use of dental services by persons with and without private dental insurance.

The information from the NHIS is based on data collected in a continuing nationwide household-interview survey. The 1989 NHIS was conducted with a full sample, composed of 45,711 households containing 116,929 persons. Since the age distributions in the various population groups may differ considerable, the data was age-adjusted to a standard population.

Data from the 1989 NHIS revealed that 40.8 percent of respondents aged 45-54 had not seen a dentist within the last year. This survey revealed that dental utilization decreases as the population ages. Forty-six percent of those respondents aged 55-64 had not seen a dentist during the past year, and 56.8 percent of those surveyed aged 65 years and over had not seen a dentist within the last 12 months (Department of Health and Human Services 1992).

Another survey finding was 40.5 percent of the population 2 years of age or older was reported to have private dental insurance coverage. Dental coverage as part of a comprehensive insurance plan was reported by 32.7 percent; 6.8 percent held policies for dental care only; and 1 percent said they were covered by both types of plan. Broken down by age groups, those who had dental insurance were: 52.7 percent of those aged 45-54; 40.2 percent of those aged 55-64; and only 15.0 percent of those aged 65 and above (Department of Health and Human Services 1992).

### **The National Survey of Oral Health in United States Adults: 1985-1986**

The 1985-1986 National Survey of Oral Health of United States Adults is a epidemiology study sponsored by the National Institutes of Health (NIH). This survey included both U.S. employed adults as well as seniors. The survey was designed to establish the prevalence of coronal caries, root surface caries, and periodontal destruction in a readily accessible adult population.

The sampling frames for this survey included U.S. business establishments listed by Standard Industrial Codes and maintained by Dun & Bradstreet as well as county rosters of multipurpose senior centers compiled from lists confirmed by the state and local area agencies on aging. The primary sampling units were counties, the second stage sampled business establishments or senior centers, and the third stage sampling units were the employees or seniors. The categories of agriculture and mining, the military, the permanently unemployed, and persons not employed outside the home were excluded from the sample.

Both samples were stratified into seven geographic regions of the contiguous 48 states. For employed persons, the sample was also stratified by urban/rural, mean income and percent minority in the sampled counties, and by size of business establishment. The final sample consisted of 15,132 persons aged 18-64, representing approximately 100 million employed adults in those age groups, and 5,686 retired persons aged 65-80+, representing 4 million seniors.

Some workers presently covered by a dental benefit program are faced with the loss of dental care coverage upon retirement. The findings of the NIH survey noted that 52 percent of all employed adults age sixty or older had dental coverage while only 33 percent of non-employed seniors had similar coverage (Department of Health and Human Services 1987).

The employed population surveyed had extensive dental insurance coverage, with 58 percent of the participants covered by public or private plans for some portion of their dental expenses. Employed adults with dental insurance can be broken down by age: (1) 45 to 49 - 61.4 percent; (2) 50 to 54 - 60.3 percent; (3) 55 to 59 - 56.4 percent; (4) 60 to 64 - 52.0 percent.

Only 33 percent of the non-employed seniors reported dental insurance coverage. Broken down by age: (1) 65 to 69 - 34.5 percent; (2) 70 to 74 - 34.33 percent; (3) 75 to 79 - 29.42 percent; (4) 80 + - 32.79 percent.

This study found only 37.46 percent of seniors 65 + had visited a dentist within the past year. This number is much lower than the 58.54 percent of all employed people who had visited a dentist at least once within the last 12 months.

### **1994-1995 Health Care Survey of DoD Beneficiaries**

The Defense Authorization Act for Fiscal Year 1993 (Public Law 102-848) mandated that the Secretary of Defense conduct an annual formal survey of persons receiving health care under Chapter 5 of Title 10, United States Code, in order to determine the following:

- The availability of health care services to authorized beneficiaries through the military health services direct care system, the types of services received, and the facilities in which the services are provided.
- The familiarity of the beneficiary with the services available within the Military Health Services System (MHSS) and with the facilities in which the services are provided.
- The health of the beneficiary population.
- The level of satisfaction with the MHSS and the quality of the health care provided through the system.
- Any other matters as the Secretary determines appropriate.

In accordance with the Congressional mandate and requirements identified by DoD, the survey asked respondents questions designed to obtain the following information:

- Access - Questions on access to medical care measures the degree of accessibility to health care. The survey instrument measured the perceived range of choice over alternative sources, point of entry into the system, degree of preventive services available, and measures of convenience in time and distance, waiting time, and appointment alternatives. Many of these issues contribute to the patient's perceived quality of care.
- Familiarity - Questions on familiarity ask whether beneficiaries have a source of information concerning various aspects of their health benefit. Familiarity with the health benefit may influence access to, use of, and perceived quality of the MHSS.
- Health Status - Questions on health status provide general measures of lost duty time, well being, fatigue, energy, and both physical and emotional health.
- Satisfaction - Questions on satisfaction include satisfaction with provider behavior, facilities, satisfaction with specific aspects of health care, and overall satisfaction with the military health care benefit.
- Utilization - Questions on utilization of dental care and health care measures the relative and comparative use of the military treatment facility and health care alternatives available to the respondent in terms of annual visits, admissions, and source of care. This survey also looks at the beneficiary's normal source of routine health care as well as dental care.
- Demographics - Questions in this section include standard demographic information, such as age, gender, race, and ethnicity, that are needed for statistical analysis. Questions in this section also include beneficiary category, education level, location, and other related variables.

In developing this survey instrument, DoD reviewed existing survey efforts to determine if the information was already available or in the planning stages. The Annual Health Care Survey

for DoD Beneficiaries had replaced existing beneficiary surveys being conducted in the Army and Air Force.

The data for this study was drawn from the 1994-1995 Health Care Survey of DoD Beneficiaries, DMDC Survey No. 94-004. The population for this survey was all persons over 18 years of age and eligible for care at DoD treatment facilities who were enrolled in the Defense Enrollment Eligibility Reporting System (DEERS).

The demographic characteristics used in this project include gender, age, beneficiary category, service affiliation, marital status, education level, and race/ethnicity. All variables were mutually exclusive and categorically exhaustive.

The validity of the survey instrument was established by conducting two pretests on random members of the population. After completing the pretest, the surveyors sat down with those surveyed and discussed each question to ensure they were worded correctly. They also ensured that the respondents were interpreting the questions as they were intended. For the purpose of this study, it is assumed that the survey instrument is both valid and reliable.

The confidentiality of the survey is assumed by the Privacy Act statement. The respondents were informed that all answers to the survey would be kept confidential and that under no circumstances would any information about individuals be released. Only group statistics would be reported. The Defense Manpower Data Center has established procedures for survey storage and disposal which ensure that individual identifiers do not appear in any analytical data set.

### **1993 Navy Survey**

In 1993 the Secretary of the Navy developed a survey, published in Shift Colors and Semper Fidelis, to gauge retiree interest in dental insurance. This 12 question survey was answered and returned by 3,098 Navy and 1,897 Marine Corps retirees.

This survey, although not scientific, can serve as an indicator of military retirees' interest in a dental insurance plan. Fifty-seven percent of the retirees and 38 percent of their family members were not enrolled in any dental insurance plan. Over 90 percent of the retirees indicated they would enroll in a dental insurance plan if offered. Forty-three percent would be interested in a plan similar to the existing Family Member Dental Plan if annual costs would not exceed \$375 per family (BUMED 1993).

Below is a breakdown of the survey results by question:

1. What is your age?

- Under age 65: 62 percent
- Age 65 and older: 38 percent

2. What is the age of your spouse?

- Under age 65: 66 percent
- Age 65 and older: 30 percent
- No spouse: 4 percent

3. What is your retired rank?

- Enlisted: 47.4 percent
- Warrant Officer: 5.1 percent
- Officer: 47.5 percent

4. How many dependent children do you have in your family?
- None: 65.4 percent
  - 1 - 2: 28.7 percent
  - 3 - 4: 4.5 percent
  - 5 or more: 1.4 percent
5. Excluding checkups and cleanings, how many dental appointments did you and your family have last year?
- None: 17.7 percent
  - 1 - 4: 56.2 percent
  - 5 - 9: 22 percent
  - 10 or more: 4.1 percent
6. Please Mark all of the below that apply to your present dental insurance coverage:
- I am not enrolled in a dental insurance plan: 57 percent
  - My family is not enrolled in a dental insurance plan: 38.3 percent
  - I am enrolled in my present employer's dental plan: 9.5 percent
  - My family is enrolled in my present employer's dental insurance plan: 33.8 percent
  - I am enrolled in my spouse's employer's dental plan: 31.9 percent
  - I have enrolled myself in a private dental insurance plan: 1.8 percent
  - I have enrolled my family in a private dental insurance plan: 2.5 percent
  - Other means of dental insurance coverage: 3.0 percent
7. How much do you pay for dental insurance coverage for yourself and your family?
- Does not apply, I do not have coverage: 65 percent

- It is free of charge: 5.0 percent
- \$1 to \$159 per year for individual coverage: 3.3 percent
- \$160 to \$199 per year for individual coverage: 25.8 percent
- \$200 or more per year for individual coverage: 1.0 percent
- \$1 to \$159 per year for family coverage: 27.2 percent
- \$160 to \$199 per year for family coverage: 1.3 percent
- \$200 or more per year for family coverage: 5.1 percent

8. How much does your spouse pay for dental insurance coverage for you and your family?

- Does not apply, no coverage: 89.3 percent
- It is free of charge: 1.7 percent
- Does not apply, no spouse: 2.1 percent
- \$1 to \$159 per year for individual coverage: 2.1 percent
- \$160 to \$199 per year for individual coverage: 0.4 percent
- \$200 or more per year for individual coverage: 0.4 percent
- \$1 to \$159 per year for family coverage: 0.9 percent
- \$160 to \$199 per year for family coverage: 0.6 percent
- \$200 or more per year for family coverage: 2.5 percent

9. Would you enroll in such a group dental insurance plan were it offered to retirees?

- Yes: 92.4 percent
- No: 7.6 percent

10. Would you be willing to contract for a dental insurance plan for:

- 18 months: 30.0 percent
- 24 months: 26.5 percent
- 36 months: 32.4 percent
- Not willing: 11.1 percent

11. Would you be willing to pay more for a plan that included orthodontics?

- Yes: 32.6 percent
- No: 67.4 percent

12. Four dental insurance options are described below. Which one seems to suit you and your family best (Table 4)?

- Option A: 19.4 percent
- Option B: 43.8 percent
- Option C: 21.9 percent
- Option D: 9.5 percent
- Not interested: 4.4 percent

**Table 4**

<b>Question 12</b>				
<b>Services</b>	<b>Coverage</b>			
	<b>Option A</b>	<b>Option B</b>	<b>Option C</b>	<b>Option D</b>
Preventive	60%	80%	0%	0%
Diagnostic (checkups)	30	80	0	0
Restorations	30	60	0	0
Oral Surgery	30	60	Fixed Fee	0
Crowns and Cast Restorations	30	50	Fixed Fee	50
Endodontics (tooth pulp)	30	60	Fixed Fee	50
Periodontics (gums)	30	60	Fixed Fee	50
Bridges	30	50	Fixed Fee	50
Dentures	30	100	Fixed Fee	50
Dental Accident	100	100	100	100
Yearly cost per Participant	\$145 to \$165	\$330 to \$375	\$150 to \$170	\$175 to \$200
Yearly Deductible	\$50	\$50	\$0	\$0

### **Resource Analysis Planning System**

The Resource Analysis Planning System (RAPS) is a population projection model database which serves as the official DoD source for capitation-based allocation of the Defense Health Program (DHP) budget among the services. The projected eligible user population for the MHSS is based on data from the services, and DoD actuary.

The Services provide estimates of active duty strength by zip code and UIC. Overseas locations use DEERS data which is reconciled to the Services planned endstrengths for each overseas country. Active duty family members are estimated by using age-dependent ratios between family members and active duty.

Retirees, their family members and survivors will be estimated based on projected data from the DoD actuary and historical ratios between DEERS and actuary data. Guard/reserve and guard/reserve family member projections are based on the worldwide guard/reserve POM by services for the Army, Navy, Marine Corps, and Air Force.

Based on the RAPS world wide population data for fiscal year 1997, 4,278,000 military retirees, their family members and survivors are eligible to participate in the Retiree Dental Insurance Program. Table 5 below gives a detailed account of the eligible population (RAPS 1997).

**Table 5**

Defense Health Program Population Data Fiscal Year 1997 - 2001					
	<b>FY 1997</b>	<b>FY 1998</b>	<b>FY 1999</b>	<b>FY 2000</b>	<b>FY 2001</b>
CHAMPUS Eligible Retirees	1,119,254	1,109,038	1,101,235	1,096,524	1,093,406
CHAMPUS Eligible Dependents of Retirees	1,885,495	1,855,764	1,849,363	1,846,486	1,845,976
Medicare Eligible Beneficiaries	1,273,304	1,324,732	1,369,109	1,406,726	1,440,268
Total Beneficiaries	4,278,053	4,289,534	4,319,707	4,349,736	4,379,650

## **CHAPTER IV**

### **DISCUSSION**

The most challenging aspect of predicting expected utilization of a new dental insurance program is the lack of experience data. Dental insurance companies are unwilling to discuss their current participation rates with outsiders. Insurance is a competitive business, and an insurance

company's ability to more accurately predict the expected demand for a dental insurance program should give this company a competitive edge over a second insurance company .

This information is closely guarded. Any proprietary information shared with an outside source, and potential competitor, is not in the insurance company's best interest. Although I assured the people I talked with I was a graduate student working on this project, I had little luck obtaining any information over the telephone.

Several dental insurance programs are offered to military retirees through military associations (Table 6). Generally an association will work with a carrier to offer insurance as a benefit to its members. Each association was contacted. In most cases a referral was made to talk with the insurance carrier, and the carrier would not discuss utilization data.

**Table 6**

Retiree Military Dental Programs			
Name of Company	Type of Product	Quarterly Premium	Maximum Allowable
American Military Society	Fee for Service	\$55 per Person \$139 per Family	\$1000 per Person
Fleet Reserve Association	Fee for Service	\$68 per Person \$114 per Family	\$1000 per Person
Marine Corps League	Dental Maintenance Organization (DMO)	\$49.79 per Person \$153.03 per Family	None
National Association of Uniformed Services	Indemnity	\$55 per Person \$139 per Family	\$1000 per Person
National Officers Association	DMO Indemnity	\$47.97 per Person \$153.03 per Family	None
The Retired Officer Association	Fee for Service	\$58 per Person \$105 per Couple	\$1600 per Person

Three associations did give me some estimates of their member participation rates in the dental program offered through their organization. The Uniformed Services Association has a dental insurance plan that is less than one year old. Members have been enrolled from mail-outs of the program. Currently the enrollment rate is two percent (Peters 1996). Mr. Peters stated that it takes approximately two years to build a plan.

The Fleet Reserve Association also offers a dental insurance plan. This plan initially was offered only to members who purchased their CHAMPUS supplement, but is now being marketed to all members. Their participation rate is currently 8 percent (Plakett 1996). Their average member age is 69.

The Retired Officer Association also offers a new dental insurance plan. Again, this is a very young plan.. It was offered initially in Virginia and Arizona with plans to gradually extend coverage to all 50 states. The plan is approximately a year old now. Although specific numbers of enrolled members or the percentages of members enrolled in the plan was not available for public information, a range between 15-20 percent for the state of Virginia was given(O'Leary 1997).

The Birch & Davis study on the Selected Reserve Dental Program determined a 25 percent participation rate in the program. Birch & Davis Associates, Inc. also performed a study for the Office of the Assistant Secretary of Defense (Health Affairs) on the Retiree Dental Insurance Program. They assumed that 50 percent of eligible retirees and their family members would participate in this program although no explanation was given as to how they arrived at this number (Birch & Davis 1997).

Since no national studies have investigated how many retired military members and their family members have dental insurance, an attempt to compare military retirees with their civilian counterparts in the same age brackets will be made. The 1994-1995 Health Care Survey of DoD Beneficiaries did not ask any insurance questions. It did ask questions about number of dental visits within the past year. The results indicate that a greater number of DoD beneficiaries, both male and female, visit the dentist within a 12 month period than do adults in both the NIH and NHIS surveys (Table 2).

The NHIS study found almost 60 percent of adults ages 55 and above had no dental insurance. In the 1993 Navy survey, 57 percent of retirees who responded to the survey had no dental insurance. The NIH study found 52 percent of all employed adults older than 60 had dental insurance. This percentage dropped to 33 percent for adults older than 60 who were non-employed. The Navy survey showed 62 percent of responding retirees were older than 65 but only 30 percent of retiree spouses were older than 65. This survey also showed 62 percent of retiree family members were enrolled in a dental insurance plan and 32 percent of retirees were enrolled in their spouse's dental insurance plan.

Cost and plan benefits also are important factors to consider. The Navy survey showed 43 percent of the respondents were interested in a dental plan if the costs were kept below \$375 per family per year (Table 4). The remaining 57 percent of the respondents wanted a plan that cost less than \$200 per family per year. The Birch & Davis study recommended premiums of \$474 per family per year (Birch & Davis 1997).

Recommended plan benefits as outlined by the Birch & Davis study are listed in Table 7. This table also lists the FMDP benefits. The most striking difference in the two dental

plans is no coverage of expensive crowns/inlays and fixed and removable prosthodontics is recommended for the RDP.

The most popular plan in the Navy survey, chosen by 43.8 percent of the respondents, included crowns/inlays and fixed and removable prosthodontics in addition to the recommended coverages by Birch & Davis. The benefit program proposed by Birch & Davis is intended to encourage prevention and was not designed to cover major restorative services so the program could attract a more "dentally fit" group and avoid adverse selection (Birch & Davis 1997).

**Table 7**

<b>Family Member Dental Plan vs. Retiree Dental Plan Coverages</b>		
<b>Services</b>	<b>Level of Coverage</b>	
	<b>FMDP</b>	<b>RDP</b>
Diagnostic	100%	100 %
Preventive	100%	100%
Sealants	80%	80%
Emergency	100%	80%
Restorative (basic)	80%	80%
Crowns/Inlays	50%	<b>Not Covered</b>
Endodontics	60%	60%
Periodontics	60%	60%
Oral Surgery	60%	60%
Fixed and Removable Prosthodontics	50%	<b>Not Covered</b>
Orthodontics	50% (\$1200 Lifetime Maximum)	<b>Not Covered</b>
Annual Maximum	\$1000	\$1000
Deductible	No Deductible	\$50 (Waived for Preventive and Diagnostic Services)

This proposed Navy plan was modeled after the existing DOD Family Member Dental Plan (FMDP). The Military Coalition wanted a Retiree Dental Plan (RDP) that had the same level of benefits as the FMDP. In addition, the Coalition wanted a similar government cost share as in

the FMDP, which is approximately 60 percent. Language under Section 703 of the National Defense Authorization Act of 1977 states the RDP would be voluntary and members would pay the premiums charged for the insurance.

The rate for a single family member in the FMDP is \$7.19 per month. The rate for two or more family members is less than \$20 per month, and this includes orthodontics which is excluded in the proposed Retiree Dental Plan. The proposed RDP rate for a single individual is \$13.27. The proposed rate for two members is \$25.09 and \$39.52 for an entire family.

Other factors that may influence enrollment in the RDP is: (1) how the program is presented to eligible retirees and their family members; (2) the method of enrollment or disenrollment of members; (3) the appeal of the benefit design to those who may need complex treatment; and (4) the number of retirees or their spouses who already have dental insurance.

In order to better understand the Retiree Dental Plan, a discussion group insurance and dental insurance follows:

### **Group Insurance**

A basic principle shared by group insurance with most other forms of insurance is the payment of a relatively small, predictable amount, the premium, in order to offset a relatively large expense arising from an unpredictable event.

Apart from this fundamental principle, group insurance differs in the manner of establishing equitable risk classes. Considerations of equity and practicality require that insurers establish homogeneous risk classes. Group insurance underwriters establish risk classes based chiefly upon the employer-employee relationship, upon the relationship of all debtors to a particular creditor, or between professional and trade association members.

## **History and Evolution of Group Insurance**

The origins of group health insurance can be traced to medieval craft guilds and mutual aid societies and even to ancient Rome. Impetus to the movement toward s group benefits was lent in 1883 by the enactment in Germany (under Bismark) of a compulsory national health plan.

Actual group insurance contracts were underwritten by insurers and developed over several decades in the U.S. One of the first health insurance contracts was provided to the Baltimore Fire Fighters by the Travelers Insurance Company in 1890. The first group life insurance contract was formed for employees of Montgomery Ward and Company by the Equitable Life Insurance Company in 1910. In 1229, Baylor Hospital in Dallas developed a hospital benefits plan covering groups of school teachers for a predetermined premium.

The growth of group insurance plans received a boost during World War II. Implementation of wage-price controls meant that group benefits were one of the few remaining means by which employers could attract employees. Since the value of group benefits was not included in employees' income, each dollar of group premium could convey more value than a dollar of extra pay.

In the 1950's, the Blue Cross approach (of providing medical services) and the commercial carrier approach of paying fixed indemnities for specific types of claims were melded with the advent of group major medical benefits, which eventually came to be sold by Blue Cross/Blue Shield plans and commercial insurers alike.

The 1970's saw a trend towards self-insurance, especially by large employers with more predictable claim patterns. Self-insurance often conferred the advantage of lower expenses

(including lower premium taxes) and permitted employers the advantage of greater control over the investment of monies allocated to their group benefits.

In the 1980's, there commenced rapid growth of flexible benefit of cafeteria type plans sponsored by medium to large sized employers. These group plans are based on the idea that each employee shall receive an annual sum of employer money to be used for death, disability, dental and various medical benefits. Typically the employer-provided money is not enough to allow an employee to buy the full measure of each benefit, thus each employee tends to choose those benefits most valuable to the family (Bilisoly 1992).

### **Dental Insurance**

Dental insurance has been one of the fastest-growing lines of business in the employee benefits field over the past two decades. Today, more than 125 million people in the United States are covered by some type of dental plan (Mayes 1996). This represents a significant increase from the six million individuals covered in 1970. Approximately 75 percent of these individuals are insured in the private commercial market, with the balance covered by the military, Medicaid, and other government institutional programs (Reich 1996).

Group dental insurance plans are generally provided through an employer and offers coverage to both employees and often their dependents. The employer's role can range from paying the full cost of the plan to just serving as a coverage facilitator by administering or sponsoring employee-pay-all voluntary or optional coverage.

Group dental insurance is similar in its most fundamental characteristics to other forms of group insurance. Coverage is provided through a master contract issued to the policyholder or plan holder, while employees receive individual certificates of coverage. The key to designing an

effective dental plan is to include a wide variety of plan design provisions and underwriting requirements to help guard against the elective nature of dental benefits. Premiums are held down by this spread of risk and the economies of scale in administration (Reich 1996).

### **History of Dental Insurance**

The dental insurance concept was first proposed as early as 1945 by the American Dental Association (ADA). However, the first provision of dental care at a discounted rate was offered as an additional service with a rural farmer's cooperative health plan formed in 1929 by Michael Schadid, M.D., in Elk City, Oklahoma (Kongstevadt 1995). Pilot programs continued throughout the 1950's, with the first comprehensive group dental plan being offered by the Continental Casualty Company in August 1959. In 1954, the International Longshoremen's and Warehousemen's Union-Pacific Maritime Association Benefit fund provided dental care under a West Coast dual-choice pilot prepaid program. This plan had a fee-for-service option with a capitation alternative (Marcus 1995).

Dental Benefit plans grew quickly from that point and are now the third most-frequent health benefit provided by employers after medical and disability (Employee Benefit Research Institute 1994). The 1994 edition of the U.S. Chamber of Commerce Employee Benefits Survey indicated that 51 percent of employers provide a dental benefits program. (US Chamber of Commerce 1994)

Initially, most employers in the U.S. offered dental benefits under a comprehensive medical plan. Under such integrated plans, dental expenses are combined with major medical benefits in the calculation of plan benefits. Subsequently, product designs shifted to freestanding dental plans, with 80 percent of all plans offered this way today (Neels 1994). Medical plans in

the U.S. continue to cover treatment required because of accidental injury to natural teeth, removal of impacted teeth and surgical treatment for temporomandibular disorders. Coordination-of-benefit provisions are used to avoid duplication of coverage with dental plans.

Dental insurance can be viewed as a reflection of the medical industry a few years ago. While affecting fewer coverage dollars than medical, approximately \$40 billion in dental expenditures out of the \$1 trillion in national health expenditures, dental costs have exhibited a similar, but less steep, steady increase in claims cost that led to medical's swift move through the managed care continuum. Despite this, dental costs have shrunk as a percentage of U.S. health expenditures from 8.4 percent in 1960 down to 4.8 percent in 1993 (Levit 1994).

As costs began to escalate in the 1980's, employers began scrambling to find more efficient programs to offer employees without compromising benefits. The dental industry swiftly evolved to match the benefits spectrum offered by health insurers. There are currently three reimbursement models dominating the marketplace. They are: (1) traditional fee-for-service (FFS or Indemnity); (2) discounted fee-for-service (Preferred Provider Organization); and (3) prepaid (Dental Health Maintenance Organization). While indemnity plans still account for 78 percent of the total, PPO's at 12 percent and Dental HMO's at 10 percent are both quickly increasing in popularity (Reich 1996).

### **The Basic Components of Dental Plan Design**

Medicine and dentistry have many differences, and sound dental plan design recognizes these. Two of the more important differences relate to the location and nature of care.

## **Location**

The practice of the typical physician is hospital oriented, while dentists practice almost exclusively in an office setting. Partly because of these practice differences, physicians tend to associate with other physicians with greater frequency than dentists with other dentists. This isolation, along with the inherent differences in the nature of medical and dental care, tends to produce a greater variety of dental care patterns than is the case in medicine. In addition, practicing in isolation does not afford the same opportunities for peer review and general quality control.

## **Nature of Care**

Perhaps contributing more significantly to the differences in medicine and dentistry are the important differences between the nature of medical and dental care. Medical care usually is mandatory, while dental care is often elective. In medicine, the patient typically visits a physician with certain symptoms, often pain or discomfort, and seeks relief. Whether real or imagined, the patient's perception is that delay can mean more pain and, under certain circumstances, even death.

Dental treatment, on the other hand,, is perceived as postponable, elective and, except in rare instances, is not life threatening (Mayes 1996). Unless there is pain or trauma, dental care often is postponed. The patient recognizes that life is not at risk and as a result has few reservations about postponing treatment. In fact, postponement may be preferable to a patient with dental fears (Hoffman 1991).

However, it is better to fill a small cavity for \$50 than to let a tooth continue to decay to the point where it needs a root canal and crown for \$900 or a fixed bridge costing \$1500 because

the tooth cannot be saved. Plan design should encourage regular appointments with the dentist because delay in treatment costs a dental plan money.

As a result, dentist's charges for major courses of treatment are often discussed in advance of the treatment where there is no pain or trauma and, like any number of other consumer decisions, the patient may opt to defer the treatment to a later time and spend the money elsewhere.

A second difference is that dental insurance is not insurance in the classic sense (Mayes 1993). Most health insurance has a high-loss severity with low frequency of utilization. For example, while most people are not hospitalized in any given year, those who are hospitalized incur high costs. Dental disease is exactly the opposite: Here there is a high frequency of utilization. The overwhelming majority of the population has some dental disease and low loss severity. Most dental disease can be treated as a much lower cost than medical illness or injuries.

A third difference in the nature of care is that, while medical care is rarely cosmetic, dental care often is requested for cosmetic purposes. A crown, for example, may be necessary to save a tooth, but it may also be used to correct a patient's appearance.

A fourth major difference between the nature of medical and dental care is that dentistry often offers alternative procedures for treating disease and restoring teeth. In other words dentistry has a good, better, and best method of treatment for the same condition. All of the treatments may be professionally acceptable and all will have different costs.

There are other differences in medical care and dentistry that will have an effect on plan design. These include frequency of treatment, the cost of the typical treatment, and the emphasis on prevention. When dental and medical plans cover the same or similar groups, there will usually be significantly higher utilization of the dental plan than of the medical plan (Rosenbloom 1988).

Another significant difference is that dental expenses generally are lower, more predictable, and budgetable. Most individuals incur dental costs of less than \$200 a year (ADA 1996). Medical claims, on the other hand, are much higher.

The last difference of significance is the emphasis on prevention. The advantages of preventive dentistry are clearly documented. While certain medical diseases and injuries are self-healing, dental disease, once started, almost always becomes progressively worse. Therefore, preventive care probably is more productive in dentistry than in medicine. The differences are summarized in Table 8 and Table 9 below.

**Table 8**

How Medical and Dental Practice Differ		
	Medical	Dental
Diseases Treated	Myriad	Mainly Two
Diagnostic Complexity	Great	Small
Diagnostic Cost	High	Low
Preventive Cost/Effectiveness	Unknown	Low/High
Institutional Based Treatment	High	Low
Nature of Diseases	Acute/Chronic	Chronic
Life Threatening	Not Uncommon	Rare
Good/Better/Best Treatment	Rare	Common

The basis of any dental benefits design is to pay for covered charges to prevent, diagnose or treat dental disease or injury. A primary emphasis in dental plans is on preventive care through checkups, cleanings and examinations. Plans encourage such care by minimizing the expense to the patient for seeking treatment before problems can get any worse.

**Table 9**

<b>How Medical and Dental Insurance Differ</b>		
	<b>Medical</b>	<b>Dental</b>
Insures Low Cost/High Frequency	Rare	Standard
Insures High Cost/Low Frequency	Yes	No

Dental plans differ from medical plans in the fairly moderate nature of claim levels. While medical bills can reach hundreds of thousands of dollars over a short time period, dental costs are usually limited in even the most extreme circumstances to several thousand dollars of treatment.

Since dental benefits are more elective than medical benefits, the difficulty in underwriting and pricing a plan of benefits is increased. Many plan provisions can be incorporated into a dental plan to limit the adverse selection resulting from the elective nature of such benefits, especially in the first year of the plan when patients will seek dental work to correct problems arising from past neglect.

Dental plan designs have been structured to include a substantial out-of-pocket cost shared by the individual, which helps ensure that they choose and use care appropriately, while their dental coverage helps ensure they can afford the care needed.

Dental plans are traditionally sold as freestanding (non-integrated) plans today. Among traditional indemnity plans, dental expenses will be covered on either a scheduled basis or a nonscheduled basis.

## **Scheduled Plan**

Under a scheduled plan, the list of covered services is specified in detail usually by reference to the nomenclature used by the ADA. Along side each covered ADA code will be a specific maximum reimbursement level (Rosenbloom 1988). The plan will pay the lesser of the actual dentist's charge and the maximum reimbursement level. If the actual charge exceeds the plan's reimbursement level, the dentist would then be allowed to bill the patient for the remainder of the charge (balance billing). Under managed care plans and some indemnity plans, contracts between the dentist and the plan administrator will prevent balance billing to the patient (Bailit 1995).

There are three major advantages to scheduled plans:

1. Cost control. Benefit levels are fixed and, therefore, less susceptible to inflationary increases.
2. Uniform payments. In certain instances, it may be important to provide the same benefit regardless of regional cost differences. Collectively bargained plans occasionally may take this approach to ensure the "equal treatment" of all members.
3. Ease of understanding. It is clear to both the plan participant and the dentist how much is to be paid for each procedure. In addition, scheduled plans sometimes are favored for employee relations reasons. As the schedule is updated, improvements can be communicated to employees. If the updating occurs on a regular basis, this will be a periodic reminder to employees of the plan and its merits (Rosenbloom 1988).

## **Nonscheduled Plan**

Under a nonscheduled plan, the list of covered services is generally shown in more descriptive terms, such as coverage for initial oral exams, instead of reference to a specific ADA code. Reimbursement is paid on a usual, customary, and reasonable basis (UCR). The usual fee is the fee that a specific dentist most frequently charges for a given dental service. The customary fee is the maximum fee level set by the plan administrator based upon charges submitted by dentists in the same geographical area for a given service. The reasonable fee is the fee charged by a dentist for a given service when unusual circumstances or complications exist (Wachenheim 1996).

There are two major advantages to nonscheduled plans:

1. Uniform reimbursement level. While the dollar payment may vary by area and dentists, the percent of the total cost reimbursed by the plan is uniform.
2. Automatically adjusts for change. The nonscheduled plan adjusts automatically, not only for inflation but also for variations in the relative value of specific procedures (Rosenbloom 1988).

This approach also has disadvantages:

1. First, because benefit levels adjust automatically for increases in the cost of care, in periods of rapidly escalating prices cost control can be a problem.
2. Second, once a plan is installed on this basis, the opportunities for modest benefit improvements, made primarily for employee relations purposes, are limited, at least relative to the scheduled approach.

3. Third, except for claims for which predetermination of benefits is appropriate, it rarely is clear in advance what the specific payment for a particular service will be, either to the patient or dentist.

The plan administrator will generally pay the usual fee up to the customary fee, unless complications exist, and then possibly the reasonable fee will be allowed. As with scheduled plans, if the actual charge exceeds the plan's reimbursement level, the dentist can balance bill the patient. Contracts with providers can prevent such balance billing.

Dental benefits are usually divided into three classes of benefit (Reich 1996).

Type I (Preventive) procedures:

- Diagnostic services: Oral exams, x-rays (sometimes type II), diagnostic tests and laboratory exams (sometimes type II), and emergency treatment.
- Preventive services: Prophylaxes, fluoride treatments, sealants (sometimes not covered or type II), space maintainers (sometimes Type II or only covered when orthodontia is covered).

Type II (Basic) procedures:

- Basic restorative services such as amalgam, silicate, acrylic, and resin restorations.
- Endodontics (sometimes Type III).
- Periodontics (sometimes Type III, sometimes periodontal surgery only is moved to Type III).
- Repairs to prosthodontics (sometimes Type III).
- Oral Surgery (extractions, sometimes more complex cases are Type III).
- Adjunctive general services such as general anesthesia.

Type III (Major) procedures:

- Major restorative services including inlays, onlays, and crowns and posts made from various materials such as porcelain and precious metals.
- Major prosthodontic services including fixed and removable bridges and full and partial dentures.

Type IV procedures:

- Orthodontics.

Each type is governed under the plan by a coinsurance percentage that splits the fee between the insurer and the patient. Plans are designed to encourage prevention and require significant cost sharing on more expensive or elective procedures. The intent is to reduce spending on optional dental care and to provide cost-effective dental practice. The typical plan design will reimburse at 80-100 percent for Type I, 70-85 percent for Type II, and 50-60 percent for Type III (Rosenbloom 1988). Most dental plans include a plan maximum, written on a calendar year basis, that is applicable to nonorthodontic expenses. Orthodontic expenses generally are subject to a separate lifetime maximum. This amount, \$1000-\$1500, is deliberately set not to cover more than 25 percent to 50 percent of the cost of the typical pair of braces because of the elective nature of the treatment (Reich 1996). Also, in some instances, a separate lifetime maximum may apply to nonorthodontic expenses.

Unless established at a fairly low level, a lifetime maximum will have little or no impact on claim liability and only serves to complicate design of the plan. Calendar year maximums encourage participants to seek less costly care and may help to spread out the impact of

accumulated dental neglect over the early years of the plan. The typical calendar year maximum is usually somewhere between \$750 and \$1500 (Schooley 1994).

Each of the services under the plan is governed by an extensive series of age and time limitations. For example, oral exams, cleanings, and fluoride treatments may be limited to twice a calendar year. X-rays will have their own frequency restrictions. Sealant treatments may be limited to children under age 16. The purpose of these limitations is to lower overall plan costs within the framework of clinically accepted standards of dental practice.

In addition to plan design features relating to benefits, dental plans often contain the following key underwriting features and plan provisions aimed at limiting plan cost and overall anti-selection:

### **Group Size**

Every dental plan contains a series of eligibility provisions which govern plan access. The most basic is the minimum group size to which coverage is offered. Groups that fall below the minimum group size can be terminated.

### **Eligible Groups**

Types of groups include: employers, unions, trusts, and associations. The underlying theme among all types of eligible groups is that they cannot be formed for the purpose of providing insurance.

### **Eligible Individuals**

Generally, plans will cover employees and their dependents. Dependents can include spouses and legally dependent children, including foster children and step-children. Dependent

children are usually covered up to age 19, or 23 if a full time student. Disabled children can be covered even beyond this age.

Most group plans are sold to active employees only. Retirees may be included in a plan if they represent a small percentage of the risk. In general, employees are covered until the termination of their employment or the group's cancellation date.

### **Participation**

Even when a minimum size is met, a plan will contain a participation requirement which will govern initial and continuing plan coverage. The most common requirement in contributory plans is 75 percent participation of all employees and dependents. Plans sold to groups with less than 75 percent participation can have their rates loaded or benefits reduced to adjust to the increased anti-selection inherent in the group's demographics.

### **Waiting Period**

The plan may have a waiting period before a new hire to a group is eligible to join the plan. Often the eligibility date is expressed as the first of the month following x months from the date of hire.

Closely aligned with the waiting period is a very important eligibility feature that sometimes places a limit on certain Type II and Type III services for new entrants and even more stringent restrictions on late entrants (who join a plan more than 31 days after first becoming eligible). These provisions are extremely important because many dental services are highly elective and postponable. Adverse selection can increase first-year costs from 25 to 30 percent or even more (Rosenbloom 1988)

A new approach to guard against poor experience in the first few years of the implementation of a dental group plan is an incentive coinsurance approach. Under such a design, benefits will start out lower in the more expensive Type II and III categories and will increase each year as long as an individual utilizes preventive services each year. For example, benefits may start at 100/70/35 in the first year and go up 10 basic percentage points and five major percentage points each year that a specified series of preventive procedures has been performed. If in any year, an individual fails to see a dentist, then benefits are reset to Year 1 level (Kronick 1995).

### **Preexisting Conditions**

A major consideration is the treatment of preexisting conditions. The major concern is the expense associated with the replacement of teeth extracted prior to the date of coverage.

Preexisting conditions are treated in a number of ways:

- They may be excluded
- They may be treated as any other condition
- They may be covered on a limited basis (perhaps one half of the normal reimbursement level) or subject to a lifetime maximum.

If treated as any other condition, the cost of the plan in the early years will be increased by about 6 to 10 percent (Rosenbloom 1988).

Another plan design consideration is the range of procedures to be covered. In addition to orthodontics, other procedures occasionally excluded are surgical periodontics. Although rare, some plans cover only preventive and maintenance expenses. These plans are becoming more

common in the cafeteria-type plans where employees often may pick a preventive plan or one more comprehensive.

Orthodontic expense, as noted, may be excluded. Where these plans are covered, the plan design may include a separate deductible to discourage "shoppers." The inclusion of a separate orthodontic deductible eliminates reimbursement for the expense of orthodontic models and diagnosis. Also, orthodontic plan design typically includes both heavy coinsurance and limited maximums to guarantee patient involvement.

### **Predetermination**

Most plans suggest that patients about to undergo treatment for services expected to total above a predetermined dollar amount submit the treatment plan for review to verify the exact nature of coverage under the plan. While mainly intended as a protection against surprises, this policy also serves as a deterrent against over-utilization of services (Employee Benefit Research Institute 1990).

### **Least Expensive Alternate Treatment (LEAT)**

One of the main reasons predetermination is so critical to the patient is the fact that dental problems can often be treated with differing procedures varying widely in cost. Almost universally, plans are generally written to cover the cost of the least expensive alternate treatment as long as it meets clinically accepted standards of practice (Atchison 1990).

### **Proof of Loss**

All dental contracts require that claim forms be supplemented by items that prove the necessity of treatment and services rendered. This usually is handled by submitting radiographs and diagnostic models.

UCR is defined as the maximum level set by the insurer as a covered charge per procedure. Most plan payers use a percentile approach to assure that they are authorizing a reasonable level of payment. The most common policy is to authorize payments up to the 90<sup>th</sup> percentile of a company or industry standard.

### **Claim Payment System**

Proper administration of a dental plan requires a sophisticated claim payment system to properly adjudicate claims. The system must automatically check against eligibility provisions, age and time restrictions. ADA service codes can be manipulated in some situations by unbundling certain charges to the practitioner's advantage. Good systems will rebuild these procedures.

### **Comparison of Dental Reimbursement Models and Delivery Systems**

The three main types of plans are indemnity, Preferred Provider Organization (PPO), and Health Maintenance Organization (HMO). Over the years, each plan has borrowed concepts from each other and the fuller list of available delivery systems is as follows (Table 10):

- Indemnity (Scheduled), Indemnity (Non-Scheduled - UCR), Managed Indemnity, discounted fee-for-service (FFS) PPO, fee schedule PPO, Point of Service (POS), Individual Practice Association (IPA) HMO, and staff model HMO.

Some of these concepts have been discussed earlier. Here the purpose is to concentrate on the differences in each of the reimbursement models:

- Indemnity (Scheduled) plans reimburse dentists up to a maximum per procedure set by the plan. All dentists are eligible to render care and those that charge above the maximum reimbursement will bill the patient for the balance. The schedule is often set

very low. These plans were quite popular in the past, but were replaced by UCR plans, because it was cumbersome to update the scheduled benefits each year. Most scheduled plans already factor in the plan's coinsurance rates when showing the allowable levels.

- Indemnity (Non-Scheduled - UCR) plans are the typical traditional fee-for-service plans that control the lion's share of today's market.
- Managed Indemnity is a concept that lets the plan take advantage of its contracted fees with its managed care dentists, even on its indemnity plans. Plan designs stay the same. Patients are encouraged, without either a special incentive or disincentive, other than reduced out-of-pocket expenses, to use network dentists. This concept is often the insurer's way of introducing the managed care concept to the group without much change imposed upon the insured.
- Discounted FFS PPO plans provide incentives or disincentives to patients to seek care from in-network providers who agree to a set percentage discount off their standard charges. Care is available out-of-network on a reduced benefit basis.
- Fee schedule PPO plans are the same as discounted FFS plans, but require in-network dentists to agree to a specific fee schedule instead of a flat discount off their own charges. Fewer dentists will agree to this, but the discounts are often greater.
- POS plans are a hybrid of Indemnity, PPO, and HMO concepts. The patient can pick at the point-of-service between receiving benefits from an in-network HMO provider and/or a PPO provider and/or any provider at different levels of benefit.

- IPA HMO plans construct their panels from independent dentists who agree to a capitation (fixed payment) approach reimbursement model.
- Staff model HMO plans employ their own dentists and offer the greatest control over cost or care.

**Table 10**

<b>Differences Between the Three Funding Arrangements</b>			
<b>Plan Type</b>	<b>Indemnity</b>	<b>PPO</b>	<b>HMO</b>
Premium	High	Medium	Low
Patient Access	Excellent	Fair	Limited
Benefit Richness	Least	Fair	Best
Reimbursement	Usual, Customary & Reasonable	Fee Schedule	Capitation
Cost Management	Least	Fair	Best
Utilization	High	High	Low
Quality Assurance	Least	Fair	Best
Provider Contract	No	Yes	Yes
Fraud Potential	High	Moderate	Low

### **Provider Contract/Credentialing**

Both PPO's and HMO's use a dental contract to arrange for services to be provided at agreed upon rates. Indemnity plans which allow full services from all dentist do not. Most contracts are for a one-year term and are automatically renewable. In the contract, the dentist agrees to abide by the plan's quality assurance and utilization management programs in addition to the discounted charges. In return, the insurer promises to steer patients to the network provider. The contract also spells out the grievance and provider relations functions. HMO contracts will also spell out specialty referral guidelines (Reich 1996).

Dentist contracts are preceded by undergoing an extensive credentialing process. This process is repeated every several years. In addition to collecting biographical and practice information, dentists are asked to reveal potential problems such as criminal offenses, past malpractice situations, and the like. HMO's often conduct on-site reviews of a dentist's practice, checking the office for Occupational Safety and Health Administration (OSHA) compliance and reviewing sample patient records.

### **Reimbursement**

Indemnity and PPO plans have been previously described as paying dentists on a fee-for-service basis.

A prepaid dental plan or Dental HMO (DHMO) pays a primary care provider a monthly fee, per member per month (PMPM), to maintain dental health even if no care is required. Thus, the indemnity and PPO model of fee-for-service reimbursement is replaced with a capitated reimbursement mechanism. The amount the dentist is paid is not directly tied to the frequency or value of services performed. In essence, the dentist and not the insurer assumes the majority of the financial risk involved in treating patients. Specialists are compensated on a discounted fee-for-service basis. Primary care and specialty dentists are chosen from a limited panel of participating providers.

### **Benefit Richness**

PPOs use the same basic plan designs as previously described in indemnity plans. The major difference is the spread in benefits between an in-network and out-of-network provider. Plan designs can be structured as follows:

- 100/100/60 in-network, 100/80/50 out-of-network. This design is to reward the patient for going in-network in comparison to a standard indemnity 100/80/50 design.
- 100/80/50 in-network, 80/70/40 out-of-network. This design penalizes the patient for not going in-network in comparison to a standard indemnity 100/80/50 design.
- Benefits can be 100/80/50 both in-network and out-of-network. In this case the balance billing on out-of-network dentists serves as a vehicle to steer patients to use a network dentist.

The typical HMO plan will include coverage for the same services provided for under indemnity and PPO models, but often with a lower out-of-pocket expense to the patient. However, HMOs will not cover purely cosmetic procedures.

The typical dental HMO plan also has no deductible and no annual or lifetime maximum. HMO benefit plans often contain richer benefits for major and orthodontic benefits than is typical in other plans. Patient out-of-pocket expenses are expressed as a copay per service. Most dental HMO plans do not have an opt-out or point-of-service out-of-network benefit. This is changing as the DHMO industry mirrors the increasing popularity of medical point-of-service (POS) plans (Schwartz 1995). By contrast, such large differentials in PPO plans are rare and generally prohibited by state PPO laws (Reich 1996).

### **Premium**

DHMO premiums are 15 percent to 25 percent below PPO plans and 30 percent to 40 percent below traditional indemnity plans (Pride 1995). HMO rates are low primarily due to the gatekeeper approach and capitation mechanism; features that control utilization thus limiting plan costs.

## **Cost Management**

Indemnity programs manage cost through UCR, LEAT, clinical logic, and predetermination. PPO's use many of the same techniques, and additionally reap the benefits of the extensive credentialing programs which are set up to find cost-effective quality dentists. HMO plans additionally have the gatekeeper approach and the specialty referral process to control utilization and thus cost.

## **Utilization**

The tendency in indemnity plans and PPO plans is to over-utilize services as a result of fee-for-service reimbursement (Kongstvedt 1995). HMO's, on the other hand, are perceived to promote an underutilization of services (Pesillo 1990). Beazoglou states that capitation plans probably require dentists to: (1) restrict the delivery of services to enrolled patients; (2) substitute lower-cost services for higher cost services; and (3) perhaps organize the delivery of services in a manner that discourages utilization by increasing indirect costs to the patient (appointment delay, travel time, and office wait) (Beazoglou 1988).

Kevin Johnson, president of a financial planning group serving dentists and physicians, has outlined some formulas for dentists to follow to help them determine if a managed care plan would benefit them financially. His bottom line is that if fees are reduced by 15 percent, production must be increased by 35 percent to realize the same net income. If fees are reduced by 35 percent, production must be increased by 106 percent (Guarino 1995). Steve Keller, D.D.S., president of a DHMO, states that the quality of dental care is not dependent upon the type of dental plan a patient is enrolled in, but is determined by the individual provider (Keller 1996).

## **Quality Assurance**

Indemnity plans offer very little chance of assuring that quality care is received. This is the "price" of free choice. PPO's and HMO's with their selective screening processes, offer at least the appearance of assuring quality. On the other hand, many plans are criticized as going after cost-efficient as opposed to quality dentists (Guay 1995). Plans have responded by issuing patient satisfaction report cards indicating overall satisfaction with provider dentists.

## **Fraud Potential**

Hand in hand with the utilization issue is the potential of fraud. Dental insurance is extremely susceptible to fraud. While the effectiveness of combating fraud is really a function of the insurer's efforts and not the particular plan types sold, HMOs and their capitation approach take away many of the incentives to commit fraud from either the dentist's or patient's perspective (Dillon 1994).

## **Direct Reimbursement**

Direct Reimbursement (DR) is a relatively new and innovative approach to self-funding employee dental plans. Recognizing the option in 1984, the ADA describes it as an alternative plan for small companies. Insurance specialists say DR is ideally suited for small employers with about 35 or fewer employees. However, DR is being used successfully by large companies like Eli Lilly, with as many as 17,000 employees (Taylor 1990), and Wachovia Corporation with 11,500 employees enrolled in DR (ADA 1996).

Under DR, a patient receives dental treatment and pays the dentist directly. Then, receipts for this treatment are turned over to the employer for reimbursement. The level of reimbursement

depends on the coverage level included in the employee benefit plan, and the employer usually reimburses the employee within 10 days (Geer 1994).

Benefits are based on a percentage of dollar expenditures up to a maximum dollar limit per year rather than on treatment received. Unlike conventional plans, there typically are no exclusions and few, if any, limitations based on specific treatments. Highly adaptable, the details of a DR plan may vary widely depending on the level of benefits the employer wishes to provide.

Some of the possible options in designing the plan include:

- Employees only or employees and dependents.
- Copayment provisions.
- Annual benefit maximums (individual and family).
- Immediate benefits or a waiting period for eligibility.

Several examples of possible DR benefit designs:

1. Example A

- 100 percent of the first \$100 of dental expenses.
  - 80 percent of the next \$500.
  - 50 percent of the next \$1000.
- \* Total annual maximum benefit of \$1000 per individual.

2. Example B

- 100 percent of the first \$200 of dental expenses.
  - 80 percent of the next \$1000.
- \* Total annual maximum benefit of \$1000 per individual.

### 3. Example C

- 100 percent of the first \$100 of dental expenses.
- 80 percent of the next \$1,750
- \* Total annual maximum benefit of \$1,500 per individual

### 4. Example D

- 75 percent of \$1,000 of dental expenses.
- \* Total Annual maximum benefit of \$750 per individual.

The ADA says direct reimbursement benefits employer and employee by reducing costs since the third party insurance company is eliminated (ADA 1996). By removing many of the complex administrative features associated with most dental plans such as detailed claim forms, service limits, exclusions, pre-authorization and profit, a DR plan is suited to employer self administration. Administrative costs can be as low as three to five percent compared to companies with third party administration which can run 10-15 percent (Taylor 1990). The American Association of Orthodontics, a dental association in St. Louis, estimates that the direct reimbursement approach lowers administrative costs by about 18 percent (Bell 1992). However, if a third party administrator is used, then costs will increase.

The ADA states that all parties benefit from a DR plan. Employers generally find it more cost-effective because they pay only for services employees use. Many employers with dental insurance find themselves paying 200 percent more in premiums than their employees receive in benefits (Danusis 1988). Typically, only 60 percent of individuals with dental benefits use them in a given year (Cooper and Danusis 1992). Statistically, three-quarters of the 60 percent of

individuals using their dental benefits incurred charges of \$75 or less for Type I treatments (Hickey 1988) and total costs less than \$200 a year (ADA 1996).

Employees are given the freedom to choose their own dentist and decide appropriate treatment. Patients become involved in the plan by their participation with copayments, annual maximums, and, when required, "up front" payment of the costs of treatment (ADA 1996). The theory is the patients will seek dentists who will provide the greatest benefit for their limited treatment dollars.

### **Estimating Claim Costs for Dental Benefits**

Estimated claim costs are the most important element in pricing dental benefits. However, there is no convenient claim cost source provided by the Society of Actuaries, such as there are for other coverages. The lack of a standard dental claim cost table is not surprising in light of the wide variation found in plan design; utilization of services by area, age, sex and insured's out-of-pocket cost; and billed fees which vary not just by area, but also by providers within each area.. In addition, dental costs will vary significantly based on group size, marketing, and underwriting procedures (Comstock 1988).

Ideally, one would like to have detailed claim costs and adjustment factors to handle every variation in plan design, insured characteristic, and cost containment program. This collection of detailed claim data is referred to as a group manual or a manual claim table. If an insurance company does not have a group manual, the following options are available:

- Expanding the company's group manual through special reports from the historical claim file.
- Obtaining a group manual from a consulting firm, a reinsurer or a cooperative carrier.

- Purchasing data from industry sources.
- Obtaining data from public and private sources

The most reliable data is sometimes based on an existing plan's actual experience. If the plan is new, the actuary must consider data from other sources. In many situations the data gathered from other sources must be modified for the specific characteristics of the plan being rated. This includes adjustments for items such as the following:

- Demographics.
- Industry.
- Geographic area.
- Degree of utilization management.
- Benefit design.
- Type of provider arrangement and reimbursement.
- Degree of provider risk sharing and incentives.
- Benefit limitations and restrictions.
- The time period for which the premium is applicable.

The actuary develops adjustment factors to help determine claim costs. Some of the adjustment factors the actuary might be interested in developing assuming voluntary enrollment would be:

- Age/Sex factors.
- Area factors.
- Employee Class/Income factor.
- Voluntary Coverage factor.
- Preannouncement factor.
- Coordination of Benefits.
- Total Relatively Adjustments.

Dental costs can vary significantly depending on the age and sex of the patient. For example, expensive major restorative services, such as bridges and dentures, are provided to adults much more frequently than to children. For that reason, rates frequently vary by the age and sex of the enrollee. Table 11 shows the relative cost at various ages for males and females for

a typical dental plan. The relative cost is a ratio of the average claim costs for each category of people compared with the total insured population.

**Table 11**

<b>Relative Dental Costs by Age and Sex</b>				
<b>Age/Sex Group</b>	<b>Class I</b>	<b>Class II</b>	<b>Class III</b>	<b>All</b>
Younger Male (under 40)	0.947	1.169	0.934	1.024
Older Male (over 40)	0.982	1.199	1.853	1.377
Younger Female (under 40)	1.107	1.250	1.142	1.172
Older Female (over 40)	1.068	1.218	2.155	1.502
Child (under 19, 23 if student)	0.947	0.617	0.091	0.516
<b>Member Average</b>	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>

Source: 1995 Millman & Robertson *Dental Cost Guidelines*

Benefit design can significantly impact the utilization of dental services. For example, richer benefits for basic restorative dental services are frequently tied to higher utilization of preventive and diagnostic services. Sometimes benefit changes are made to a plan from one year to the next. In that case, an adjustment may have to be made to the rate based on past experience. Actuaries are frequently called upon to determine what effect benefit changes will have on the rate. The cost of dental services varies significantly by geographic area. Table 12 shows the relative cost for a typical dental plan in selected cities. These figures are based on a typical mix of dental services.

**Table 12**

Relative Dental Costs by Area	
City	Area Factor
Boston	1.24
Los Angeles	1.33
Minneapolis	1.00
Omaha	0.82
Salt Lake City	0.84
U.S. Average	1.00

Source: 1995 Millman & Robertson *Dental Cost Guidelines*

In 1994 the actuarial firm of Millman & Robertson, Inc. was asked by the Office of the Assistant Secretary of Defense (Health Affairs) to determine the potential premiums for a CHAMPUS retiree dental plan based on experience with the Family Member Dental Plan (FMDP). The assumptions that guided this analysis was that all CHAMPUS eligible retirees would be signed up initially but could opt out if they had other dental insurance coverage or desired to do so. Additionally, retirees who remained in the plan would be locked in for a period of 36 to 48 months.

The next six steps are examples of how Millman and Robertson calculated the cost of a dental insurance plan based on prior group experience.

#### **Step 1**

The final cost determination is not important for this paper. The methodology used to determine a rate structure is of importance. First, Millman & Robertson determined the demographics and age/sex factors. The retiree and adult dependent eligible population was determined by sex as well as age groups. From this population break-down, adult age/sex factors and child age/sex factors were developed for Class I, Class II, and Class III dental treatment. An age/sex factor was also developed for orthodontics (Table 13).

**Table 13**

Retiree and Dependent Eligible Population					
Age Bracket	Age	Retirees	Family	Survivors	Total
<b>Adult Male</b>	To 25	2930	0	0	2930
	25-29	9046	1738	1225	12039
	30-34	9046	1738	1257	12041
	35-39	81581	1655	583	83819
	40-44	81580	1655	583	83818
	45-49	212986	1072	214	214782
	50-54	209126	511	99	209736
	55-59	239380	286	71	239737
	60-64	312459	262	78	312799
	65+	574086	1287	298	575671
<b>Adult Female</b>	To 25	392	0	0	392
	25-29	1281	17601	3488	22370
	30-34	1281	17600	3486	22367
	35-39	5004	98910	5697	109611
	40-44	5004	98909	5697	109610
	45-49	3943	175746	8711	188460
	50-54	1857	194299	16310	212466
	55-59	1421	213828	30182	245431
	60-64	2003	207678	46196	255877
	65+	8386	320931	163215	492532
<b>Total Adult</b>		<b>1,762,792</b>	<b>1,355,706</b>	<b>287,480</b>	<b>3,405,978</b>
Composite Age Sex Factors					
	<b>Class I</b>	<b>Class II</b>	<b>Class III</b>	<b>Orthodontics</b>	
<b>Adult Age/Sex Factor</b>	1.001	1.245	2.169	1.000	
<b>Child Age/Sex Factor</b>	0.928	0.601	0.090	1.100	

**Step 2**

Calculations for area factors for each state in the US are made next. From these state factors, a composite area factor is determined.

### Step 3

The next step is to determine basic contract period projections. In this case, the experience data from a similar dental plan is used since the cost per beneficiary is known. The center date for the experience period is established. Next, the center date for the projection period of insurance coverage is determined. In this example, the difference in center dates is 18 months.

Since the projection date for retiree insurance coverage is determined to be 12 months, a ratio of 18/12 is multiplied by the annual percent increase in dental costs to determine the annual dental cost increase (ADCI) factor. This same method is used to determine the voluntary disenrollment utilization trend (VDUT) factor. A high initial utilization pre-announcement adjustment (HIUPA) factor is determined next. The products of the ADCI, VDUT, and HIUPA multiplied by the experience data cost of beneficiary will yield a new basic contract period claim cost per beneficiary (Table 14).

**Table 14**

Basic Contract Period Projection	
Experience Data (1/10/93-30/9/94)	
Incurred Claims (1)	\$180,000,000
Beneficiary Months (2)	\$15,000,000
Cost Per Beneficiary (1) / (2)	\$12.00 (3)
Projection	
Experience Period 1/10/93-30/9/94	Center Date 1/4/94
Projection Period 1/4/95-30/3/96	Center Date 1/10/95
Difference in Center Date	18 Months
Benefit Adjustment	1.000
5 % Annual Cost Trend = $0.05 ^ { (18/12)}$	1.075 (4)
Voluntary Disenrollment Utilization Trend = $0.02 ^ { (18/12)}$	1.030 (5)
High Initial Utilization Adjustment Factor	1.12 (6)
Basic Contract claim Cost Per Beneficiary (1/4/95 - 3/30/96) (3) ^ (4) ^ (5) ^ (6)	\$14.881

Table 15

Adjustment Factors						
Retirees and Dependents			Current Population		Relativity	
	Adults	Children	Adults	Children	Adults	Children
<b>Age/Sex</b>						
Class 1	1.001	0.928	1.099	0.926	0.911	1.000
Class 2	1.245	0.601	1.262	0.601	0.980	1.000
Class 3	2.169	0.090	1.151	0.090	1.884	1.000
Orthodontia	1.000	1.100	1.000	1.000	1.000	1.100
<b>Area</b>						
Class 1	0.960	0.960	1.000	1.000	0.980	0.980
Class 2	0.960	0.960	1.000	1.000	0.980	0.980
Class 3	0.960	0.960	1.000	1.000	0.980	0.980
Orthodontia	0.960	0.960	1.000	1.000	0.980	0.980
<b>Employee Class/Income</b>						
Class 1	1.000	1.000	0.900	0.900	1.111	1.111
Class 2	1.000	1.000	0.900	0.900	1.111	1.111
Class 3	1.000	1.000	0.900	0.900	1.111	1.111
Orthodontia	1.000	1.000	0.900	0.900	1.111	1.111
<b>Voluntary Coverage</b>						
Class 1	1.512	1.512	1.325	1.325	1.000	1.000
Class 2	1.512	1.512	1.325	1.325	1.000	1.000
Class 3	1.512	1.512	1.325	1.325	1.000	1.000
Orthodontia	1.512	1.512	1.325	1.325	1.000	1.000
<b>Preannouncement</b>						
Class 1	1.240	1.240	1.000	1.000	1.240	1.240
Class 2	1.240	1.240	1.000	1.000	1.240	1.240
Class 3	1.240	1.240	1.000	1.000	1.240	1.240
Orthodontia	1.240	1.240	1.000	1.000	1.240	1.240
<b>Coordination of Benefits</b>						
Class 1	0.995	0.995	1.000	1.000	0.995	0.995
Class 2	0.995	0.995	1.000	1.000	0.995	0.995
Class 3	0.995	0.995	1.000	1.000	0.995	0.995
Orthodontia	0.995	0.995	1.000	1.000	0.995	0.995
<b>Total Relativity Adjustments</b>						
Class 1					1.368	1.501
Class 2					1.472	1.206
Class 3					2.116	1.110
Orthodontia					0.000	1.519

#### Step 4

The next step is to determine adjustment factors for: (1) age/sex; (2) area; (3) employee class/income; (4) voluntary coverage; (5) preannouncement; and (6) coordination of benefits.

These factors can be determined for all adults, all adults younger than 65, and children. Factors can also be developed for Class I-III dental treatment. All these factors can be used to develop a number of total relativity adjustments (Table 15).

#### Step 5

From the plan's past experience, a percentage allocation of Class I-III usage can be determined. Based on the per member per month (PMPM) costs, the allocation of retiree costs for Class I-III can be determined by multiplying the total PMPM cost by the percent allocation (Table 16).

**Table 16**

Allocation of Projected Monthly Claim Cost			
	Adults	Children	Composite
Percentage of Population	78.6%	21.4 %	100.00%
Percent Allocation of PMPM			
Class 1	51.29%	56.09%	52.78%
Class 2	43.30	23.97	38.80
Class 3	5.41	0.76	5.26
Orthodontia	0.00	19.18	3.16
Monthly Claim Cost (Table 3)			
Allocation of Monthly Claim Cost			
Class 1	\$5.686	\$6.515	\$6.183
Class 2	5.821	2.784	4.007
Class 3	3.709	0.088	1.545
Orthodontia	0.000	2.228	1.331
<b>Total</b>	<b>\$15.218</b>	<b>\$11.615</b>	<b>\$14.881</b>

**Step 6**

Finally, the total relative adjustments calculated in step 4 can be multiplied by the retiree costs for Class I-III determined in step 5 to calculate the PMPM plan costs (Table 17).

**Table 17**

Projected Monthly Claim Cost			
	Adults	Children	Composite
<b>Allocated Monthly Experience Claim Cost (1)</b>			
Class 1	\$5.686	\$6.515	\$6.183
Class 2	5.821	2.784	4.007
class 3	3.709	0.088	1.545
Orthodontia	0.000	2.228	1.331
Total	\$15.218	\$11.615	\$14.881
<b>Total Relativity Adjustments (2)</b>			
Class 1	1.368	1.501	
Class 2	1.472	1.206	
class 3	2.116	1.110	
Orthodontia	0.000	1.519	
<b>Allocated Monthly Claim Cost (Multiply monthly claim cost experience (1) by relativity adjustment factor(2))</b>			
Class 1	\$7.778	\$9.779	\$7.286
Class 2	8.568	3.358	6.998
class 3	7.848	0.098	7.709
Orthodontia	0.00	3.384	0.596
Total	<b>\$24.194</b>	<b>\$16.619</b>	<b>\$22.589</b>

## **CHAPTER V**

### **CONCLUSIONS AND RECOMMENDATIONS**

During the course of this research, various studies were visited in an attempt to help predict the expected participation rate in the Retiree Dental Plan (RDP) by military retirees, their family members, and unmarried surviving spouses. Insurance industry sources were of limited value due to the competitive nature of the insurance business.

The 1985-1986 National Survey of Oral Health in United States Adults (NIH), the 1989 National Health Interview Survey (NHIS), the 1994-1995 Health Care Survey of DoD Beneficiaries, and the 1993 Navy Retiree Survey were all used as sources to help predict participation in the RDP.

These studies have shown that military retirees utilization of dental care in the United States is similar to that of the general population when broken down by age group. The DoD 1994-1995 survey showed that dental visits within a 12 month period are actually higher for military retirees and their family members than for the general population as a whole after age 55. Before that age the two populations are similar in terms of utilization of dental services.

Fifty-seven percent of the retirees and 38 percent of their family members in the Navy survey had no dental insurance. However, over 82 percent of this population said they had visited the dentist within the past year for treatment other than checkups and cleanings. This indicates a high degree of dental utilization even in the absence of dental insurance.

The Birch & Davis Retiree Dental Program Benefit Design study assumed a 50 percent participation rate. The anticipated premiums are higher than those for the Family Member Dental

Program, and the plan design is less generous. This is primarily because the total cost of the plan is to be born by the retirees and their beneficiaries. The plan is also voluntary.

The best indicators of expected retiree participation in the RDP is based on conversations with three military associations that offer retiree dental insurance plans. The participation rates of the total membership in the three dental plans was low at 2 percent, 8 percent, and between 15-20 percent.

Because the RDP is less generous than the FMDP with higher premiums, and a large number of military retirees and their family members are either already covered by a dental insurance plan or see a dentist on a regular basis regardless of dental insurance status, this study's predicted participation rate in the DoD Retiree Dental Plan is anticipated to be approximately 20 percent.

This is in sharp contrast to the Birch & Davis study that anticipates a 50 percent participation rate in the RDP. The RDP is scheduled to begin on 1 October, 1997. This study, along with the Birch & Davis studies on the Selected Reserve Program as well as the Retiree Dental Program, should be revisited 18-24 months after both plans have been implemented. The experience of both dental plans will help DoD to more accurately predict utilization in the future.

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